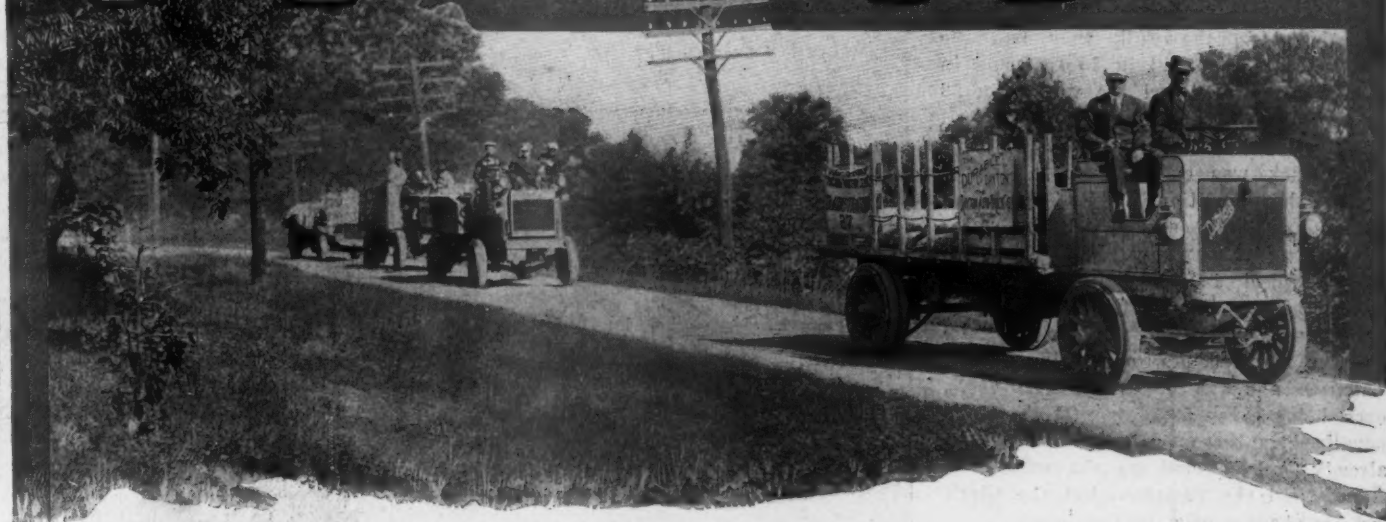


MOTOR AGE



TYPICAL SCENE DURING COMMERCIAL MOTOR VEHICLE DEMONSTRATION—DURABLE DAYTON IN THE FOREGROUND

Chicago Truck Run Model of Its Kind

Twenty of the Thirty-Two Starters in 3-Day Demonstration Make Perfect Scores Both on Road and in Technical Examination—Only Four of Original Field Fail To Complete the Test—Interesting Statistics Result of Trials

CHICAGO, Sept. 22—Results attained in the recent commercial motor vehicle demonstration of the Chicago Motor Club, which started Monday and which concluded Wednesday night, are such that the event is bound to long stand as the pattern after which future tests of this sort will be modeled. Following closely the idea of the Manufacturers' Contest Association as to the form of contest power wagon events should take, the local organization successfully conducted the affair and demonstrated that the rules evolved by the makers are safe and sane and as a whole just what are desired by the truck manufacturers. Results in a Nutshell

In a nutshell, the story of the 3-day event is this: Thirty-two power wagons started; twenty-eight finished; four withdrew, four were penalized in the road test; four more went out under the technical examination; one was penalized in the brake test and two in the clutch test, leaving twenty with perfect scores.

On top of this comes the satisfaction of knowing that the demonstration undoubtedly aroused the interest not only of the local business world, but among the prospective buyers in other cities. The publicity attendant upon the demon-

**PERFECT SCORES
IN CHICAGO TRUCK RUN**

Division 2-K—Mercury
Division 3-K—No. 4 Buick; No. 6 McIntyre; No. 7 Crown
Division 4-K—No. 9 Clark; No. 10 Clark; No. 11 Le Moon; No. 12 Little Giant; No. 16 Lauth-Juergens; No. 20 Chase
Division 6-K—No. 22 Stegeman
Division 7-K—No. 24 Mals
Division 8-K—No. 25 Aico; No. 26 Old Reliable; No. 27 Durable Dayton; No. 28 Pope-Hartford
Division 9-K—No. 29 Saurer; No. 30 Stegeman; No. 31 Sampson
Division 10-K—No. 33 Saurer

stration was far superior to what the makers got on the Chicago-Detroit run and undoubtedly every man who participated is satisfied. No protests were filed and the management of the affair has not had one of its rulings questioned.

Another good point about the run was that the routes were confined almost entirely to the business zone in and around Chicago. True, the trucks went out into the country but then they followed routes which they would be called upon to take in the course of ordinary business.

Hammond, Whiting, Evanston, Oak Park and Chicago Heights all are suburban towns whose merchants keep closely in touch with Chicago and who necessarily will in the future do much of their trucking with motors instead of depending upon horses or the railroads.

Clutch and Brake Tests

So far as the road work was concerned, the test came to an end Wednesday night when the run to Chicago Heights and return was finished. Then the trucks were garaged until yesterday, when the technical committee donned overalls and got busy. The first things tackled were the brake and clutch tests, which took place in the alley in the rear of the White garage. Paced by a pleasure car, the trucks were called upon to speed down the alley at the limit of their class pace. Each was given 50 feet in which to stop and every foot over that meant 1 point. Only one of the power wagons failed to do this, that being No. 3 Clark which slipped 3 feet past the line while the hand brake was being used.

An interesting feature in connection with this test was furnished by the horse-drawn rig, No. 13, which made the trip to Chicago Heights and return in 2 days, while the motors made it in 1 day. It

was decided by the technical committee that No. 13 should go through with all the formalities so far as possible, and the two horses were driven into the alley and put to the brake test. Of course the driver could not use brakes, for in this flat country horse-drawn rigs do not have them as a rule, but the horses were called upon to show in what distance they could stop at a walk and again at a trot. Gravely they went through the stunt and in the walk they had the wagon at a standstill in 15 feet and in the trot they checked the vehicle in 28 feet.

The clutch test came next. In this each truck was called upon to demonstrate the condition of its clutch by facing an 8-inch curb. With the motor running at its maximum speed, the clutch was dropped in and either the rear wheels had to spin or the motor kill to escape penalty. Two failed to come up to the requirements, one being No. 5 Sampson and the other No. 14 Adams, each being given 5 points. Of the three penalized in these two departments, two already had suffered on the road, the Adams and the Sampson, but the Clark lost its chances of a perfect score.

Final Inspection of Truck

Following this the trucks were garaged and turned over to the technical committee for a final inspection. This was not anywhere near as rigid as in the case of the pleasure cars, the committee contenting itself by looking only at the essentials—the running gear, transmission mechanism and steering apparatus. No search was made for loose nuts or bolts or things of that sort which ordinarily bring penalizations in pleasure car runs.

This examination robbed three of the cars of perfect scores. The greatest sufferer was No. 3 Clark, to whose score, already blackened by the 3 points in the brake test, were added 105 points—5 points for a broken spring leaf and 100 points for a broken brake connection. No. 8 Krickworth was penalized 100 points—75 for a broken spring horn and 25 for a bent tie rod. The Krickworth had a good excuse, all the trouble being brought about by a skid into the ditch. Another perfect score went when No. 17 Lauth-Juergens was discovered to have two broken spring leaves, also caused by a ditch adventure. No. 18 Decatur was given 30 points for two broken spring shackles.

All this work completed, the committee found itself at the end of its task. The 3 days of running had not been so bad after all. True, few definite class winners had been evolved, but that was not the aim of the competition, if it may be called such. The idea was to prove to the business world that commercial motor vehicles are dependable.

In just four classes were there definite winners and in one of them the winner had no opposition. No. 1 Mercury won class 2K but its only opponent was

another Mercury. No. 22 Stegeman won class 6K in which the Reliance was the other contestant. No. 24 Mais had a walkover in class 7K, while No. 33 Saurer was lonesome in 10K.

Class 3K returns three cars as cup winners—No. 4 Buick, No. 6 McIntyre and

No. 7 Crown. In No. 4K No. 9 Clark, No. 10 Clark, No. 11 Le Moon, No. 12 Little Giant, No. 16 Lauth-Juergens and No. 20 Chase are tied with perfect scores. None finished in 5K, the McIntyre, the only starter, having quit the second day, when it damaged its steering gear in a collision



REMOVING LOAD TO MAKE A CHANGE OF TIRES

CHICAGO MOTOR CLUB'S COMMERCIAL DEMONSTRATION RESULTS

No. Car	No. of Cyl.	Bore	Stroke	Hand Brake	Emergency Brake	Clutch	Gearset	Road	Technical	Total
Division 2-K, 501-1,000 Pounds, 12 Miles Per Hour										
1 Mercury	2	4 1/4	4	0	0	0	0	0	0	0
2 Mercury	2	4 1/4	4	0	0	0	0	72	0	72
Division 3-K, 1,001-1,500 Pounds, 11 Miles Per Hour										
4 Buick	2	4 1/4	5	0	0	0	0	0	0	0
6 McIntyre	4	4 1/4	5 1/4	0	0	0	0	0	0	0
7 Crown	4	3 3/4	4 1/2	0	0	0	0	0	0	0
5 Sampson	2	4 3/4	4 3/4	0	0	5	0	10	0	15
8 Krickworth	2	5	5	0	0	0	0	0	100	100
3 Clark	4	3 3/4	5	0	3	0	0	0	105	108
Division 4-K, 1,501-2,000 Pounds, 11 Miles Per Hour										
9 Clark	4	3 3/4	5	0	0	0	0	0	0	0
10 Clark	4	3 3/4	5	0	0	0	0	0	0	0
11 LeMoon	4	4	4	0	0	0	0	0	0	0
12 Little Giant	2	5	4	0	0	0	0	0	0	0
16 Lauth-Juergens	4	4	4	0	0	0	0	0	0	0
20 Chase	3	4 1/4	4	0	0	0	0	0	0	0
17 Lauth-Juergens	4	4	4	0	0	0	0	0	10	10
14 Adams	4	3 3/4	5	0	0	5	0	6	0	11
18 Decatur	4	4	4	0	0	0	0	0	30	30
15 Swanson	2	5 1/4	4 3/4	withdrawn	withdrawn	withdrawn	withdrawn	0	0	0
19 Monitor	2	5 1/4	4 3/4	withdrawn	withdrawn	withdrawn	withdrawn	0	0	0
Division 5-K, 2,001-3,000 Pounds, 10 Miles Per Hour										
21 McIntyre	4	4 5/16	4 3/4	withdrawn	withdrawn	withdrawn	withdrawn	0	0	0
Division 6-K, 3,001-4,000 Pounds, 8 Miles Per Hour										
22 Stegeman	4	4 1/4	5 1/4	0	0	0	0	0	0	0
23 Reliance	2	5	5	0	0	0	0	319	0	319
Division 7-K, 4,001-5,000 Pounds, 7 Miles Per Hour										
24 Mais	4	4	5 1/4	0	0	0	0	0	0	0
Division 8-K, 5,001-7,000 Pounds, 6 Miles Per Hour										
25 Alco	4	5	6	0	0	0	0	0	0	0
26 Old Reliable	4	4 3/4	5 1/4	0	0	0	0	0	0	0
27 Durable Dayton	4	4 3/4	5 1/4	0	0	0	0	0	0	0
28 Pope-Hartford	4	4 1/2	5	0	0	0	0	0	0	0
Division 9-K, 7,001-10,000 Pounds, 6 Miles Per Hour										
29 Saurer	4	4.3	5.5	0	0	0	0	0	0	0
30 Stegeman	4	4 1/2	5 1/4	0	0	0	0	0	0	0
31 Sampson	4	5	5 1/2	0	0	0	0	0	0	0
32 Alco	4	5	6	withdrawn	withdrawn	withdrawn	withdrawn	0	0	0
Division 10-K, 10,001-15,000 Pounds, 5 Miles Per Hour										
33 Saurer	4	4.3	5.5	0	0	0	0	0	0	0

TABLES SHOWING WEIGHTS OF TRUCKS AND BRAKE TEST RESULTS IN CHICAGO RUN

Weight of Commercial Motor Vehicles in Pounds							Brake Tests—Distance in Feet in Stopping		
No.	Car	Empty			Loaded		No.	Car	Foot Hand
		Front	Rear	Total	Front	Rear			
1	Mercury	955	955	1810	1040	1830	2850	1040	18
2	Mercury	875	975	1840	1000	1845	2890	1050	32
3	Clark	1350	1875	3175	1500	3310	4770	1595	28
4	Buick	1400	1325	2680	1830	2600	4460	1780	20
5	Sampson	1515	1385	2860	1770	2630	4365	1505	24
6	McIntyre	1475	1475	2830	1675	2530	4225	1395	41
7	Crown	1365	1425	2680	1610	2635	4235	1655	29
8	Krickworth	1635	1135	2710	1890	2490	4425	1717	27
9	Clark	1635	1800	3400	2000	3540	5500	2100	28
10	Clark	1700	1900	3520	2310	3460	5640	2120	42
11	LeMoon	1575	1850	3400	1750	3770	5480	2080	24
12	Little Giant	1350	1500	2780	1780	3020	4860	2080	45
13	Adams	1925	1925	3785	2025	3770	5860	2075	24
14	Lauth-Juergens	1875	1515	3330	2195	3205	5430	2100	25
15	Lauth-Juergens	1995	1600	3500	2210	3460	5620	2120	26
16	Decatur	2055	1950	3940	2295	3740	5990	2050	18
17	Chase	1250	1425	2630	1670	3210	4700	2070	26
18	Stegeman	350	2825	5050	2560	6760	9320	4270	11
19	Reliance	3500	2525	5830	4530	5534	9975	4145	10
20	Mals	3030	3720	6720	2970	8950	11835	5115	4
21	Alco	4550	4430	8745	6575	9470	15900	7155	10
22	Old Reliable	3510	4680	7975	4460	10770	15165	7190	7
23	Durable Dayton	3925	3550	7450	5365	8170	13510	6060	10
24	Pope-Hartford	3450	4040	7330	4330	9390	13440	6110	11
25	Saurer	2670	4250	6790	3600	12500	15930	9140	9
26	Stegeman	3250	5200	8215	3540	13000	16340	8125	11
27	Sampson	4500	6355	10800	6375	14815	20900	10100	8
28	Saurer	2850	5640	8380	4100	17455	21525	13145	4

with a beer wagon. Class 8K, for the 2½ and 3½-ton trucks, was remarkable in that all four of the contesting cars went through clean and to a tie, the successful ones being No. 25 Alco, No. 26 Old Reliable, No. 27 Durable Dayton and No. 28 Pope-Hartford.

In class 9K, in which four 5-ton trucks had started out, three went through with perfect scores, those being No. 29 Saurer, No. 30 Stegeman and No. 31 Sampson. No. 32 Alco, the other starter, was eliminated the second day by a burned-out bearing. No. 33 Saurer had a walkover in the big class.

Work of the Horses

The Chicago Motor Club deserves credit for originality in introducing the horse element into the motor truck demonstration, or rather, John H. Kelly, chairman

of the subcommittee having the test in charge does, for the results obtained are such that now motor truck manufacturers have something official on which to base their assertions when drawing comparisons between the work of the horses and the motor trucks.

It is in point of speed that the comparisons can be drawn, for no attempt was made to arrive at the cost of operation, so far as the motor trucks are concerned. As a matter of fact the expenses of the horse-drawn rig amounted to less than \$10 for the 2 days it was in service. This, however, has nothing to do with the speed. In this line the demonstration was a great victory for the motor, for it did in 1 day what it took the horses 2 days to do.

From the starting point at the White

garage to Chicago Heights and back is a distance of 61 miles. The horses were sent away at 9:10 a. m. Tuesday morning, while the motor trucks were going to Evanston and Oak Park. The equines made Pullman for the noon stop, where they were checked out again an hour later by the postmaster of the town. Chicago Heights in 1 day proved too much of a task for the horses, and at 5:54 that afternoon the driver decided to call it a day's work at Homewood, 9 miles from the turning point. He got an early start Wednesday morning, leaving Homewood shortly after 7 o'clock, going from there to Chicago Heights and then squaring away for the run home. It was a long plug, that last leg, but the horses made a really creditable performance when they pulled up at the White garage at 7:20 o'clock in the evening, after having been driven nearly 40 miles in 11 hours.

The Chicago Motor Club was honest in its effort to give a true line on the two modes of transportation. A paid observer was put on the horse-drawn rig, the horses were given their hour's rest at noon, and there was absolutely no criticism heard, even from the horsemen. The horses that were selected for the trip were husky looking brutes, both of them in good health and evidently possessed of all kinds of horse power. They carried 2 tons of sand, the catalog capacity of the vehicle, and the observer saw to it that the load was carried the full distance.

Old Adam Does Well

Another feature of the demonstration was old Adam, the Reliance truck which has been in the service of a local brewery for the last 5 years and which is declared to be the oldest motor truck in Chicago, from the viewpoint of service. Old Adam made the entire trip, although penalized on the first and second day. On the third day, which was by no means the easiest, the veteran ran through with a clean score card.



SAURER BREAKS THROUGH BRIDGE ON THIRD DAY'S RUN

Analysis of

Recent Chicago Demonstration Opens Eyes of Makers as to Speed Possibilities in Business Districts

THE 3-day truck demonstration of the Chicago Motor Club has been prolific in good to the truck makers who entered and also to the buyers who wanted to get a line on what the different types of delivery wagons and trucks can do under an official test. The market for big trucks and delivery wagons is in the big cities and in this respect the club filled the bill by confining the demonstration to the metropolitan area of Chicago. On 1 day the run was entirely within the traffic zone of the city, the traffic being so dense that some of the contestants suffered delays of 16 minutes in going a little over 1 mile within the loop. This is practically one of the greatest traffic congestion zones on the continent and the experience gained has been taken to heart by nearly every entrant in the contest. The experience gained in the traffic zone appealed especially to the makers of 1-ton trucks more than to builders of 2-ton, 3-ton, 5-ton or 6.5-ton trucks because the big trucks can make as rapid headway through traffic as 1,000-pound delivery wagon. The big trucks ran on a slow schedule of 5 and 6 miles per hour; this is the average speed of traffic through zones of congestion but the smaller vehicles, running on a schedule of 11 miles per hour, found it impossible to average this speed in the traffic zones. They were held back at every corner by the traffic policemen and then had to beat it whenever possible in order to make up time.

Makers Learn Something

Before the experience of 1 day in traffic many of the makers of smaller trucks were guaranteeing as high as 15 miles per hour anywhere in the city for their trucks but after a day of official demonstration they were willing to cut the guarantee to 10 miles per hour. One maker said that he would not guarantee over 10 miles per hour on his vehicles for congested zones. The reader must remember that when these same little trucks got onto semi-traffic-congestion areas they were able to make an average of 15 miles per hour with ease, but such conditions do not exist in all parts of the city.

This speed experience is one of the most valuable of the demonstration. Speed has been going against the commercial vehicle for months. The inexperienced salesman will guarantee any speed to 25 or 30 miles per hour and in addition would guarantee the truck for life. Such would-be guarantees are absurd; they injure the business; they spoil sales instead of mak-



Scenes in Chicago Motor Club's Truck Demonstration

1—POPE-HARTFORD SUCCESSFULLY TAKING THE CLUTCH TEST 2—MAIS AND SAURER SLOW FOR CARS AHEAD 3—RELIANCE, OLDEST TRUCK IN CHICAGO, APPROACHING CHICAGO HEIGHTS 4—MERCURY, WINNER OF ITS CLASS

Truck Work

Tire Problem Evidently One of Main Issues Which Confront Makers of Commercial Motor Vehicles

ing sales; and they will eventually put such dealers out of business.

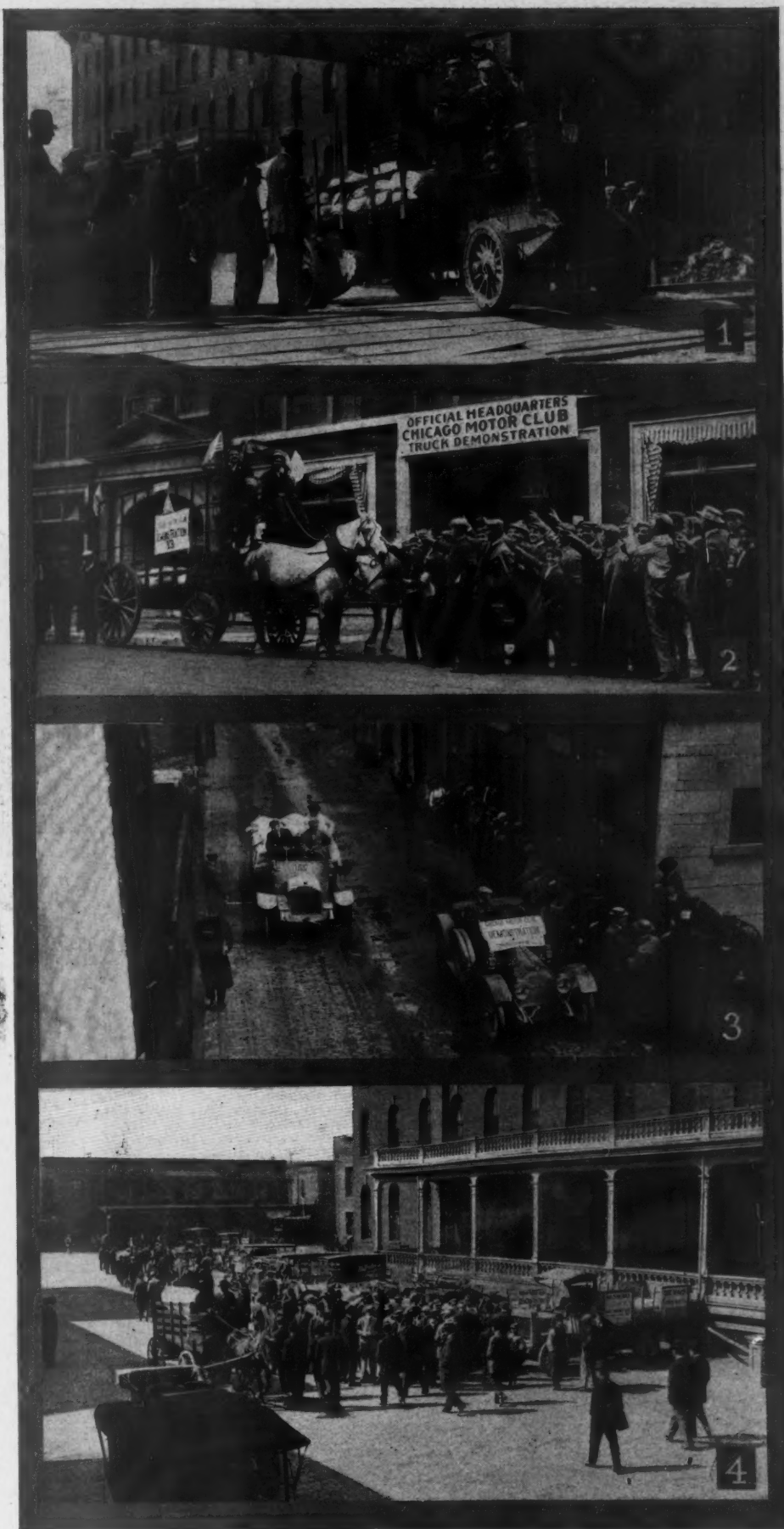
The one trouble which evidenced itself during the demonstration was that of hard tires. The solid rubber tire is imperative for heavy trucks, say from 3 tons up, and the trouble with it is in its coming off. When a solid rubber tire comes off, the wheel has to go to the tire repair shop before a new tire can be attached. The driver cannot put on a new tire on the road the same as with a pleasure car.

Difficulties of Tire Changing

Should a 5-ton truck lose a tire when 5 or 6 miles from the point of delivery, it would be necessary to get another wheel to the truck. This means that the truck owner should carry extra wheels, shod with tires in stock. To get the wheel out to the truck takes time and time means money. From this demonstration it would seem that the demountable solid rubber tire is the only solution of the problem. It should be easier to supply a satisfactory demountable rim for a truck than for a touring car because a solid tire is used. Some of the makers have such tires and rims but more of them are needed. On a 5-ton truck fitted with dual solid rear tires the wheel with its two tires will weigh anywhere from 700 to 840 pounds. To carry an extra wheel around on the truck means quite an extra load in itself. To carry a single rubber tire with its rim would not be much over one-quarter of such a load. For trucks in which the motor is carried under a hood, the same as in a touring car, a single front tire of the same size as one of the dual rears could be used, so that one extra tire carried on the truck would be enough for all exigencies. On the other hand where the motor is carried under the seat, the seat being up in front, a heavier front tire is needed and this would make it necessary to carry two sizes of spare tires, which would be much preferable to carrying two extra wheels.

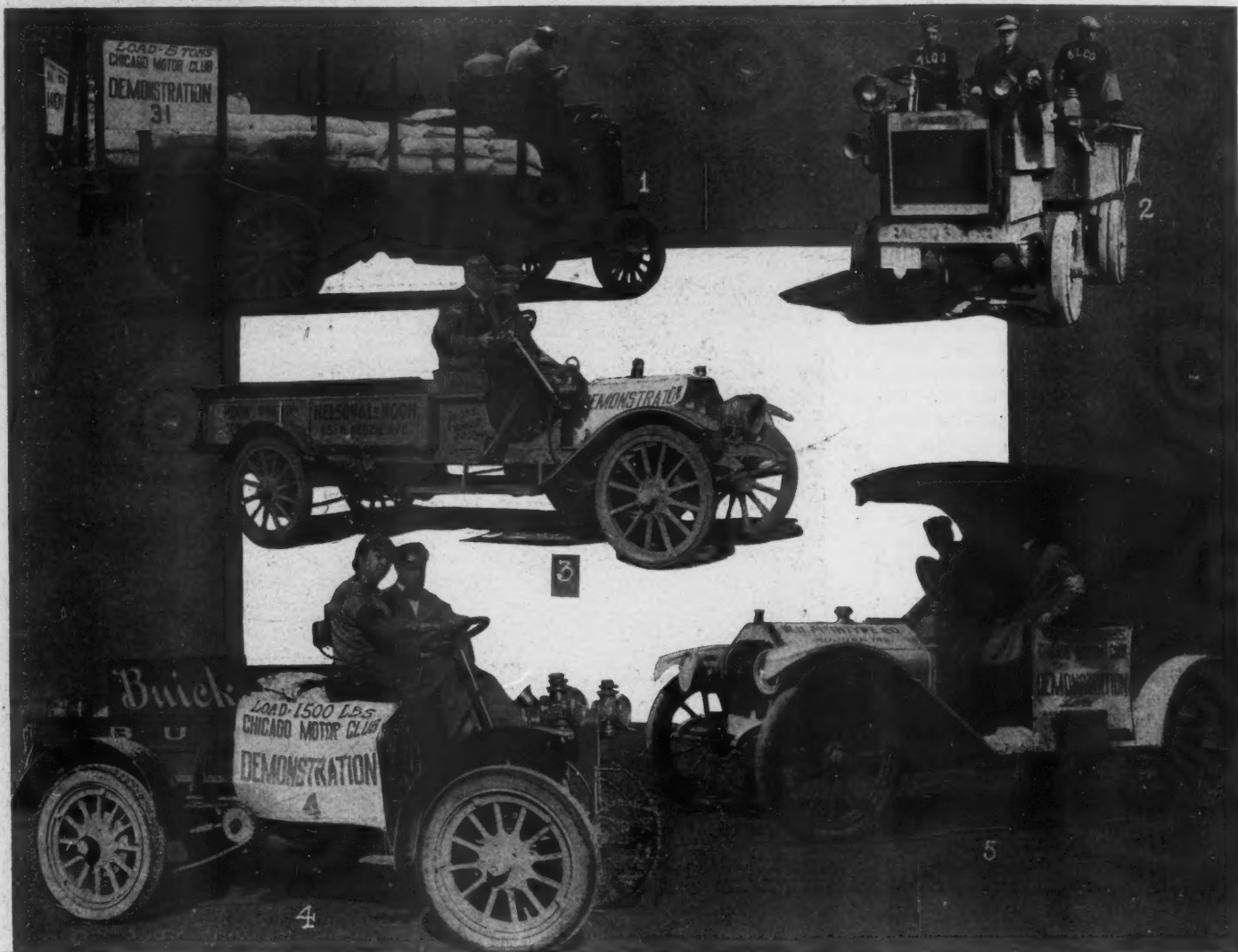
The truck must operate on schedule. If it does not it loses money to the owner. It delays the shipment of merchandise to out-of-town places; it may cause cancellation of orders; it may do a dozen other things, solely because it loses a tire and has to be hung up on the street until a new wheel arrives, so this point should be watched by truck makers.

From the table of truck weights, printed on another page of this issue, it is apparent that some of the trucks are very heavy for the useful load they carry. For



Scenes in Chicago Motor Club's Truck Demonstration

1—BIG SAMPSON, MAKING GETAWAY FROM UNION STOCK YARDS. 2—TWO-HORSE TRUCK WHICH TOOK PART IN DEMONSTRATION. 3—BRAKE TEST AT FINISH OF RUN. 4—NOON STOP OF TRUCKS AT THE STOCK YARDS.



1—NO. 31 SAMPSON 2—NO. 25 ALCO 3—NO. 11 LE MOON 4—NO. 4 BUICK 5—NO. 6 MCINTYRE FINISHERS IN CHICAGO COMMERCIAL MOTOR CAR DEMONSTRATION

convenience a separate table is attached herewith:

No.	Name	Truck Weight	Load Carried
1	Mercury	1,810	1,040
2	Mercury	1,840	1,050
3	Clark	3,175	1,575
4	Buick	2,680	1,780
5	Sampson	2,880	1,505
6	McIntyre	2,830	1,395
7	Crown	2,680	1,655
8	Krickworth	2,710	1,717
9	Clark	3,400	2,100
10	Clark	3,520	2,120
11	Le Moon	3,400	2,080
12	Little Giant	2,780	2,080
14	Adams	3,785	2,075
16	Lauth-Juergens	3,350	2,100
17	Lauth-Juergens	3,500	2,120
18	Decatur	3,940	2,050
20	Chase	2,630	2,070
22	Stegeman	5,050	4,270
23	Reliance	5,830	4,145
24	Mals	6,720	5,115
25	Alco	8,745	7,155
26	Old Reliable	7,975	7,190
27	Durable Dayton	7,450	6,060
28	Pope-Hartford	7,330	6,160
29	Saurer	6,790	9,140
30	Stegeman	8,215	8,125
31	Sampson	10,800	10,100
33	Saurer	8,380	13,145

These figures show that for loads of 1 ton and under the truck weight approximates one-third more than the load it

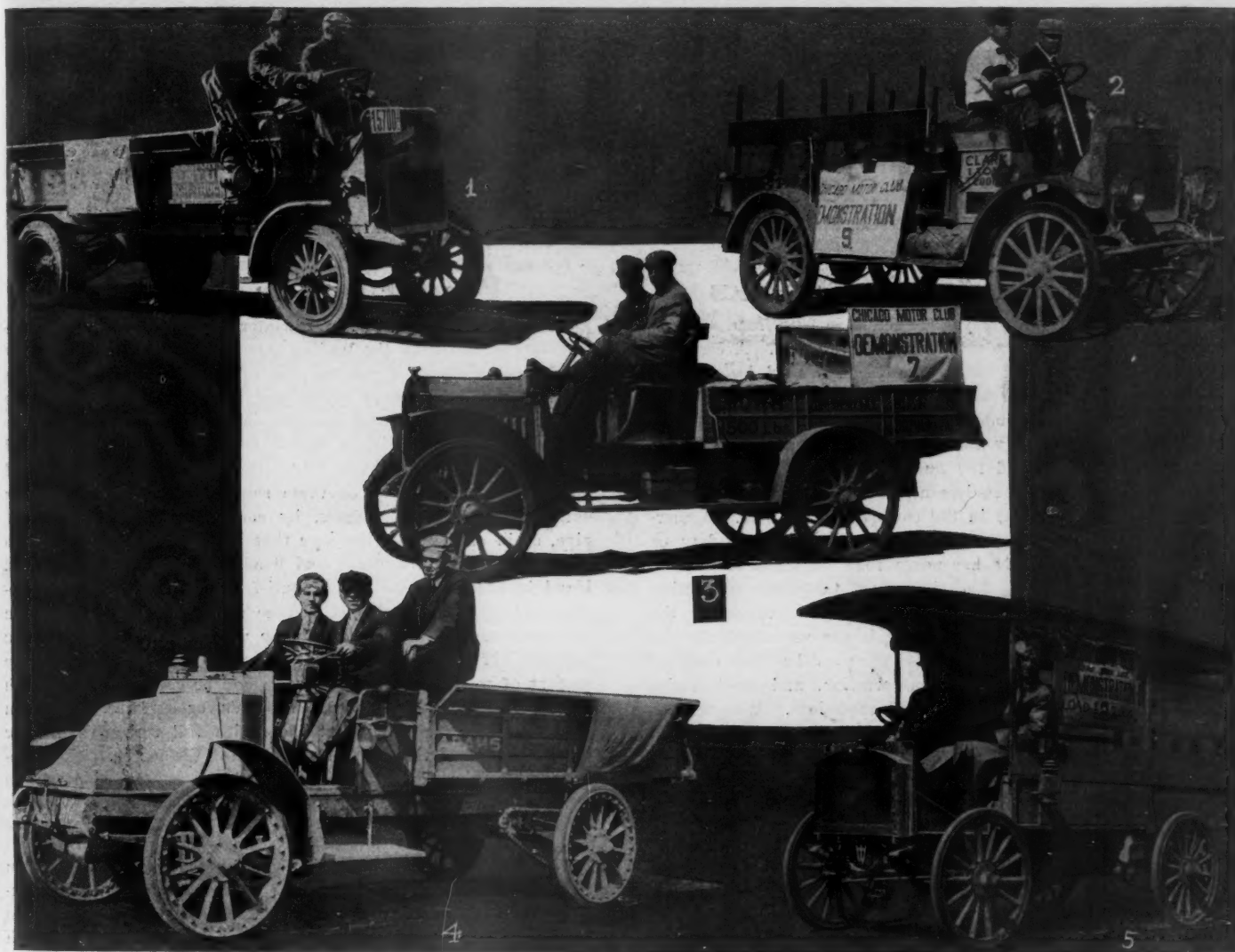
carries. In some of these the truck weight is almost double that of the load capacity of the machine. In the 2-ton and 2.5-ton trucks the truck weighs about 25 per cent more than the load it can carry. In the 3-ton and 3.5-ton classes the truck weight is not more than 14 per cent in excess of the load carried. As the truck capacity increases the weight of the load and the weight of the truck come almost together, thus the Sampson No. 31 weighed 10,800 pounds and carried a load of 10,100, or 700 pounds less than its own weight. The two Saurer trucks were the only examples of the truck being much lighter than the load carried, thus the 4.5-ton truck, No. 29, weighed 6,790 and carried a useful load of 9,140, or more than 40 per cent more than its own weight. Again in the 6.5-ton one, No. 33, the truck weighed 8,380 and carried 13,145, or more than 50 per cent more than its own weight.

Question of Weights

What has happened in the weight line in the touring car field will without doubt take place in the truck field. Touring cars were specially heavy in the early days; later came the trend for light-



MERCURY, ONE OF SMALL CLASS CONTESTANTS



1—NO. 18 DECATUR 2—NO. 9 CLARK 3—NO. 7 CROWN 4—NO. 14 ADAMS 5—NO. 12 LITTLE GIANT PROMINENT IN CHICAGO COMMERCIAL MOTOR VEHICLE DEMONSTRATION

weight cars, due to improvements in alloy steels; this ultra craze for light weight has had a little setback in the last two seasons and now a more medium weight proposition is being manufactured. Many of the trucks are too heavy for the work they do. Much weight can be cut out in places. It takes motor power to carry the truck's own weight along and if 2,000 pounds can be cut off the weight of a 5-ton truck, it should make the carrying capacity of that truck commensurately greater; it should reduce the tire upkeep on that truck; and it should reduce the general wear and tear on the truck.

Lessons That are Taught

It is poor economy to load up with heavy parts if smaller ones will do. If ordinary steels will not give adequate strength without using enormous mass, then the natural solution is to use better steels and cut down the size of the parts. There is much to be done in this respect, as this table will show. With the small delivery the proportion of car weight to load will never be as favorable as with the big truck, on the ground that a small truck requires almost as many pieces in its makeup as a big truck does. There is not

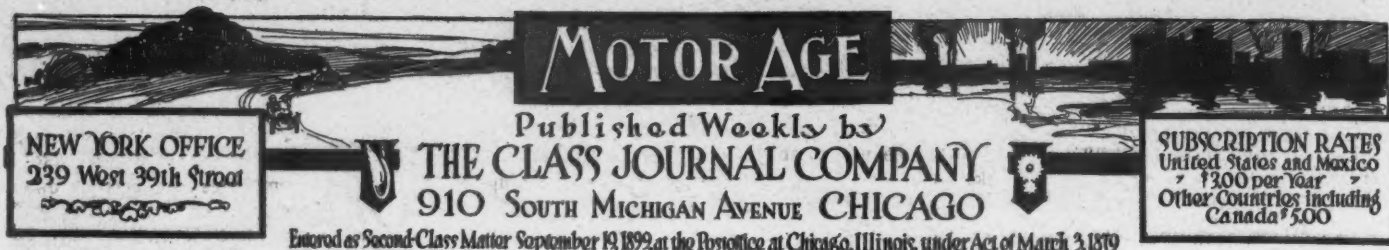
much difference in the weight of a magneto needed on a small car and that needed on a big truck. The same holds true with many other parts, and which accounts for the weight preponderance as compared with the load, in many of the vehicles in the 1-ton, or under, classes.

As the brake table on another page shows, all of the contesting trucks were well braked. The rules allow 50 feet as

stopping distance in the brake tests. This is too much. For trucks of 5-ton or over and traveling at 6 miles per hour 20 feet is enough. Some of them stopped in the amazing distance of 3 feet, others in 4, 7, 8 or 9 feet, with only one set of brakes used at once. Trials were not made to show what distance would be required when both sets were used together.



LAUTH-JUERGENS MAKING GOOD PROGRESS



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Roads Needed for Trucks

THERE are two leading physical factors in a railroad system; the roadbed is one, the rolling stock is another. A company can have the largest and most approved types of locomotives, it can have the finest passenger car equipment, it can have all that is latest and most modern in the line of freight car equipment, but if it has not a roadbed this fine equipment is of little value. On the other hand the finest roadbed is quite valueless without the rolling stock equipment. What is true in the rail-roading sphere is also true in the commercial car field. A merchant can have the best motor truck that money can buy or science construct, but if he has not a road on which to use the truck where is its value? The city street, the street connecting the metropolis with the suburb, and the road connecting the big city with the satellites surrounding it are necessities for the motor delivery wagon and the motor truck. The time required in transportation, the cost of transportation, and truck maintenance are all dependent on the road conditions. With a poor road prompt deliveries are impossible, except in good weather. It costs a merchant real money every time his delivery truck is delayed 1 hour because of being marooned in a soft spot in the road. The merchant also loses in reputation with his customers.

THE truck maker is doing his part today in developing a good truck but he is forgetting about the roadbed. His locomotive is up to par but the roadbed is at a deplorable discount. The truck maker says that the city street, the suburban street, or the intercity road is not up to him. Perhaps that is true, but is it not a fact that the truck maker is losing sale because of the poor roadbeds? From this viewpoint it is very apparent that it is more or less up to the truck maker. The maker of pleasure cars is today busying himself with the good-road cause. A few years ago he said it was not up to him, but today he is acknowledging that it is up to him. Some of our leading makers are getting on the good roads committees; others are making big donations to special road building movements; and some of our biggest car organizations are lending moral and financial aid to the building of our roads. This is exactly what our truck builders will have to do. They must look after the roadbed. They have a good line of rolling stock already but what good is a 5-ton truck for intercity traffic if the bridges are not strong enough to carry it with its load?

THE truck maker should join hands with the merchant and others in the demand for better streets and suburban roads in many cities. It would pay many department store owners to help municipalities to improve their through roads over which deliveries are to be made rather than to have the trucks stuck in the mud holes. It would pay other concerns that have similar delivery work; and it would pay the truck makers and the truck dealer to take this matter in hand and get some united action in the improvement of the roads and bridges. The truck builders should realize now that their field has a two-fold aspect, the truck and the roadbed; that one is almost useless without the other, and that every step in the improvement of the roads and streets, makes the selling of trucks that much easier. It makes selling easier because it reduces the expense of truck maintenance and so makes the vehicle a more appetizing factor to the buyer; it hastens deliveries and so makes the value of the truck vastly greater than it otherwise would be.

Preparing for the Cold

GETTING the car ready for winter use and for winter quarters is becoming the leading topic at this season. In many of the northwestern states the use of anti-freezing mixtures in the radiators has already begun and winter bodies will soon be a necessity. The radiator mixture naturally comes first, and is one of the most essential in that a frozen radiator with cracked waterjackets is an expensive bit of car maintenance. It is good policy before using any of these solutions to thoroughly clean out the radiator and jackets, by connecting the radiator exit pipe, or in other words the pipe that leads through the pump to the jackets, with a hydrant and flooding the entire system out. Hand in hand with the use of anti-freezing mixtures is the employment of radiator shields. These are generally used only in extremely cold weather but could be used to advantage in other seasons. If these shields were so made and fitted that the amount of radiator surface covered could be changed easily much greater good would result. Such shields, or curtains, have been used to advantage throughout the entire fall season, and their use has increased the thermal efficiency of the motor. The gasoline motor is a heat power plant and the conservation of the heat in this way is beneficial.

WITH the first cold weather a good precaution is to turn on the hot water into the jacket of the carburetor. The majority of car owners cut this carburetor circuit out during the hot summer weather in order to get a better mixture, but with the cold early fall days, starting becomes quite difficult unless the heated water is used. To the use of the carburetor jacket might be added that of adding the hot air tube for the carburetor air intake. Many carburetor makers who did not provide the hot air tube this year are offering a hot air horn for the carburetor air intake and to this horn can be attached a flexible metal tube to take the hot air from around the exhaust manifold. This not only aids starting but greatly helps the carburetor in the cold weather. Without such devices it is often necessary to change the carburetor adjustment. Changing the carburetor adjustment for cold weather is very dangerous, because one change of adjustment may throw the entire carburetering system out and bad spots, as they are called, will be met with in the different ranges of throttle control. Good advice is not to change your carburetor adjustment simply because there is a very cold morning. Install the hot air pipe, and use the waterjacket, if your carburetor is fitted with one.

IT is a certainty that more attention is going to be given this year to the matter of keeping the motor warm with the car standing, than ever before. The ordinary mud apron does not keep much of the cold, which rises from the road, away from the car. Metal is a good conductor of heat and a correspondingly cold medium. What is needed is some kind of packing or lining inside of the mud apron which will prevent the heat radiation and keep out the cold. There is not any reason why such cannot be fitted for winter use; its worth would be inestimable. If this can be accomplished then indeed will the motorist be well fortified against Jack Frost. With his cooling system well protected, with the hot water device taking care of the carburetor and with the anti-freeze mixture in the radiator, there will be less of this talk of putting the car away for the winter and thus curtailing its use.

Fast Racing On the Circular Tracks

DETROIT, Mich., Sept. 26—Wet weather prevented the running of the dirt track races at the state fair last week, so the card was carried over to yesterday and today. The condition of the track yesterday, however, was such that the races themselves were called off and the afternoon devoted to record trials. Burman in the Benz went after the 50-mile record, but quit in the twenty-fourth mile when a tire went up. He succeeded in lowering the 20-mile record to 17:57%. Burman later broke the local track record for 5 miles, doing 4:31%. Kulick in his Ford special did 3 miles in 2:43%. The afternoon was pieced out with exhibition matches in which Flanders, Warrens and Herreshoffs competed.

The sport today was featured by a sensational performance by Kulick in the Ford special, who did a mile from a standing start in :50, faster than the best of Burman in the Blitzen Benz, :51%, and Kilpatrick in the Hotchkiss, :56.

DE PALMA STARS AT HARTFORD

Hartford, Conn., Sept. 29—A tire mishap robbed Ralph de Palma of an opportunity to break the 15-mile circular track record at Charter Oak park yesterday afternoon, for at the end of 10 miles de Palma was 4 seconds ahead of Oldfield's mark and gaining speed at every mile in his Simplex. The trial was the climax of the race meet held under the direction of the Automobile Club of Hartford before a crowd of 5,000 persons. De Palma was the chief attraction. He went after the track's mile record and failed, covering the distance in 52.15 seconds, the record being :51.35. Later he went after Oldfield's Charter Oak Park record for 5 miles, and succeeded, his time being 4:23, 12.5 seconds faster than the record. The meet was a decided success in every way. The track conditions could not have been better and the weather was ideal.

Only two races were run, de Palma winning both in a Mercer. In both he defeated the same men, Brainard in a Cole and Beach in a Mercer being second and third respectively in each.

SANE MEET AT POINT BREEZE

Philadelphia, Pa., Sept. 23—Ralph de Palma added to his laurels and popularity at the racing matinee conducted by the Philadelphia Automobile Trade Association at the Point Breeze mile circular dirt track this afternoon. De Palma, driving a Simplex, smashed the local track mile record of :58.4, setting a new mark of :57.7; won the 10-mile open race, incidentally reducing the track record of 5:45 for 5 miles to 5:27, and setting a mark of 10:42 for 10 miles; and romped home a winner in the following event, a 5-mile free-for-all race. In the special event, free-for-all handicap, however, he was forced to be content with third place, the winner of the event having 1

minute start, or nearly a mile, a lead which he was unable to overcome. De Palma finished up a good day's work by winning a 25-mile special race with ease.

The E-M-F came in for a great deal of commendation during the day, Jack Tower piloting the car to victory in the only two events in which it was entered.

Profiting by the unfortunate results



*September 30—Track meet, Bridgton, N. J., South Jersey Motor Club.

*September 30—Track meet, Guttenberg, N. J.

October 2-7—Outdoor show at St. Louis.

*October 3—Track meet, Flint, Mich.

*October 7—Track meet, Danbury, Conn., Agricultural Society.

*October 7—Track meet, Springfield, Ill., Springfield Automobile Club.

*October 7—Fairmount Park road race, Philadelphia.

October 7-14—Fall opening of Chicago Automobile Trade Association.

*October 9-13—Reliability run of Denver Motor Club.

October 11-18—Six-day endurance run from San Francisco to Los Angeles and return.

October 12—Oklahoma reliability run, Daily Oklahoman.

October 12-13—Track meet, Peoria, Ill., Peoria national implement and vehicle show.

*October 14—Santa Monica road race, Los Angeles, Cal.

October 14-25—Glidden tour, New York to Jacksonville.

October 16-18—Reliability run of Harrisburg Motor Club, Harrisburg, Pa.

*October 27-November 3—Eight-day reliability run of Chicago Motor Club.

October 31—Track meet, Shreveport, La.

November 1—Track meet of Waco Automobile Club, Waco, Tex.

November 2-3-4—Reliability run of Quaker City Motor Club, Philadelphia.

November 3-4—Track meet, Columbia, S. C., Automobile Club of Columbia.

November 3-11—England's annual Olympia show.

*November 4-6—Phoenix road race, Maricopa Automobile Club.

*November 9—Track meet of Maricopa Automobile Club, Phoenix, Ariz.

November 9-11—Track meet, San Antonio Automobile Club.

November 22—Start of 11-day around-Georgia tour.

*November 27—Vanderbilt road race, Savannah, Ga.

November 30—Grand Prix race, Savannah, Ga.

January 6-13—Twelfth annual show, pleasure car division, Automobile Board of Trade, Madison Square garden, New York.

January 6-20—Madison Square Garden show, New York City, Automobile Board of Trade.

January 10-17—Annual show, Motor and Accessories Manufacturers, Madison Square garden, New York.

January 10-17—Annual show, National Association of Automobile Manufacturers, Grand Central palace, New York.

January 15-20—Twelfth annual show, commercial division, Automobile Board of Trade, Madison Square garden, New York.

January 27-February 10—Eleventh annual show under the auspices of the National Association of Automobile Manufacturers, Coliseum, Chicago.

March 13-20—Show of Boston Commercial Motor Vehicle Dealers' Association, Mechanics' building, Boston.

*Sanction already issued

attending the race meet at Syracuse last Saturday, extraordinary care was taken to avoid even a semblance of repetition of anything of the kind. Extra forces of police, on foot, mounted and on motor cycles, were on duty and spectators were roped off to prevent the more venturesome from letting their enthusiasm get the upper hand and straying near the track. As a result the races were void of even the slightest mishap, without detracting in the slightest from the comfort and enjoyment of enthusiasts. The meet was the first ever conducted by the Trade Association and the contest committee made a perfect job of it, each event being run off promptly and without long-drawn-out and irksome delays. Summary:

One-mile record trials—Ralph de Palma, Simplex, won; time :57.7. Other trials—J. R. Raimsey, Cino, 1:03.76; Erwin Bergdoll, Benz, 1:04.70.

Five miles, class E, cars ranging in price \$1,000 and under—Jack Tower, E-M-F, won; time, 6:30%. Baker, Metz, second; time, 8:59%. Hupmobile and Buick did not finish.

Five miles, class E, cars ranging in price \$1,500 and under—Tower, E-M-F, won; time, 5:58. Morton, Klinekar, second; time, 6:03. Roberts, Abbott-Detroit, third. Time, 6:06%.

Ten miles, class E, cars ranging in price \$2,000 and under—Raimsey, Cino, won; time, 11:35. Haupt, Buick, second; time, 11:59.41.

Ten miles, class E, special event, open to class C, non-stock cars or chassis 451 to 600 cubic inches—De Palma, Simplex, won; time, 10:42.07. Bergdoll, Benz, second; time, 10:45.18.

Five miles, class D, free-for-all, non-stock cars, 5 miles—De Palma, Simplex, won; time, 5:24.18. Bergdoll, Benz, second; time, 5:26.05. Raimsey, Cino, third; time, 5:28.45.

Ten miles, class E, special event, free-for-all, non-stock, handicap—Parker, Ohio, won; time, 11:07. Haupt, Buick, second; time, 11:52. De Palma, Simplex, third; time, 11:53.

Twenty-five miles, class E, non-stock, 161 to 300 cubic inches—Raimsey, Cino, won; time, 28:25.18. Parker, Ohio, second; time, 28:28.91. Seachrist, Klinekar, third; time, 30:11.95.

Twenty-five miles, class C, special event, 301 to 600 cubic inches, non-stock—De Palma, Simplex, won; time, 27:22.55. Morton, Klinekar, second; time, 31:46.16. Haupt, Buick, third; time, 32:52.25.

SIX IN QUAKER RACE SO FAR

Philadelphia, Pa., Sept. 23—Active preparations are under way for the Quaker City Motor Club for the fourth annual Fairmount park road race, to be held on October 7. Steam rollers, watering carts and a gang of men are at work daily under competent supervision getting the course in shape, and in order to have the roadway in as perfect condition as possible, there will be no let-up in the work by the organization until the day of the race.

Six cars have been entered so far, but by the time the full list is completed on October 2 it is expected that never before will this eastern classic have contained such a representative list of cars and daring drivers. Most of those entered last year will drive this time and several new faces will be seen. As was the case last year, the proceeds from the sale of seats and parking places will be given to charitable organizations.

The entries at the present time are: Lozier, to be driven by Ralph Mulford; National, Len Zengel; National, Donald Herr; Fiat, Lee Oldfield; Case, Joe Jagersberger, and Stutz, G. Anderson.

Knight Addresses the New Yorkers

Inventor of Slide Valve Motor, on Short Visit to This Country, Guest of Honor at Important Dinner, Tells Easterners Interesting History of Development of His Famous Engine



AT WHEEL, W. ARTHUR LESSER, STEARNS COMPANY; CHARLES Y. KNIGHT; REAR SEAT, LEFT TO RIGHT, L. B. KILBOURNE, MR. KNIGHT'S PARTNER; F. E. LONAS, MR. KNIGHT'S AMERICAN REPRESENTATIVE; W. OWEN THOMAS, MR. KNIGHT'S AMERICAN ENGINEERING REPRESENTATIVE

NEW YORK, Sept. 25.—The New York Athletic Club was the scene of an important dinner this evening tendered to Charles Y. Knight, the Chicago inventor of the Knight slide valve motor, who arrived on the Campania at this port on Saturday for a short visit. More than 100 guests were present including representatives of the four licensees of the Knight patents in America. After an elaborate dinner Mr. Knight told in simple and direct fashion the story of his inventions, dating from the commencement of the motor car, when he had wide experiences with one of the earliest air-cooled models and also with some of the steam types in vogue at that period.

Mr. Knight Tells His Story

Mr. Knight's remarks on the development of his present motor naturally were very closely associated with the name of L. B. Kilbourne, who has been his Chicago partner in all of this development work, Mr. Kilbourne having been a most enthusiastic financial partner from the earliest days of the invention. Mr. Knight's thoughts were turned to the development of a quiet motor solely because of the noise created by the earlier types. It was only after years of development in an Oak Park, Ill., garage that he finally evolved the conception of two reciprocating sleeves between the piston and the cylinder to take the place of the poppet valves which he considered the big noise factors in a motor. Crude as his earliest conceptions were and imperfect as was the manufactured product, yet those conceptions covered the complete field, and

the Knight type of motor of today is but an evolution of those earliest conceptions, the major factor not having been altered in the slightest.

Old Cars Still Running

That Mr. Knight had solved the sleeve valve problem before it was adopted by any of the manufacturing concerns that are now licensees is demonstrated by the fact that the original machines manufactured in Chicago by Knight & Kilbourne are all in commission still and giving satisfactory service. Since that time the efficiency of the motor has been greatly increased by the use of heavier crankshafts, more crankshaft bearing surface, improved lubrication methods, improved cylinder design, etc., but all of the time leaving unmolested, except for a few refinements, the reciprocating sleeve feature.

The introduction of the motor into England was more or less unexpected. F. E. Lonas, present attorney for Knight & Kilbourne, entering the small edge of the wedge for this European introduction. Before sailing for England on a business trip Mr. Lonas made a cursory examination of the Knight motor and put a catalog in his pocket. During a London dinner engagement with Percy Manville, an engineer and director of the Daimler company, Coventry, Eng., he brought up the subject of the Knight motor. A perusal of the catalog by Percy Martin, general manager of the Daimler company, led to the request for a motor in order to demonstrate its efficiency. Mr. Knight immediately set out from Chicago with a standard motor to make the demonstration. After

months of testing in the Daimler laboratory and redesigning many parts the motor was adopted, the Daimler company becoming the first licensee, and at once devoting all of its attention to manufacturing this type.

The success achieved by the Daimler company led to the examination of the motor by the Mercedes company, in Germany, the Minerva company, in Belgium, and the Panhard company, in France, all of which have since become licensees. The Minerva company has been building nothing else but Knight motors for two seasons. Over half of the Panhard output is the Knight design, and the Panhard company has announced that it will exhibit nothing but Knight motored cars at the New York shows. The Germany Mercedes company brought out its first chassis early in the present season and has been bringing them through in regular quantities ever since. There are one or two other European concerns using the Knight motor, namely, Rover, in England, and Sigma, in Switzerland.

Popularity in America

It has been with Mr. Knight the old story of "a prophet is without honor in his own country." The American manufacturer was not interested in his motor until the foreign maker had taken it up. Since then engineers of many American concerns have studied it and already it is being manufactured in America by the Dayton Motor Car Co., the F. B. Stearns Co., and the Columbia Motor Car Co. The Atlas Engine Works is a licensee to build motors of this type, and it is rumored, in the inside circles, that one other of America's oldest manufacturing companies has an option on a license and is at present investigating the matter.

The earliest introduction of the Knight motor in America began in 1907, when four of the leading manufacturers determined to secure the license for America. The introduction of it by these four concerns was upset when one of the concerns secured a reissued patent covering slide-valve construction for steam engines. Mr. Knight was compelled to fight this matter in the courts as he was threatened with action for infringement on Sage steam patents if he attempted to manufacture his own engine in this country. He won his point, but the activities in the introduction of the Knight motor in America were delayed thereby. Since the introduction of his motor abroad Mr. Knight has resided at Coventry, England, where it has been convenient for him to superintend the entire introduction of his motor in all of the European countries.

Knight Motor in America

During the evening many statements were made by the American licensees relative to the introduction of the motor in America. Horace de Lissers stated that 40 per cent of the number of cars to be built by the Columbia and Stoddard-Dayton companies under Knight patent had

already been contracted for, and that the Columbia company is arranging to increase its output of Knight types 100 per cent, and the Stoddard-Dayton 75 per cent. The Stearns company, according to C. E. Hadley, has finished forty cars already. H. J. Halle spoke in an enthusiastic manner regarding the work of the Atlas Engine Works on this motor.

At Automobile Club of America

New York, Sept. 27—Special telegram—In the presence of a gathering numbering close to 400, Charles Y. Knight explained in detail the Knight sleeve valve motor at the Automobile Club of America this evening. For more than an hour the assembly listened with profound attention to the inventor's address and at the end the speaker was questioned on a number of points and devoted another hour to answering the queries. Mr. Knight used a huge working model of a sectional cylinder in making his address.

HALLADAY IN COURT AND OUT

Chicago, Sept. 26—Since Saturday the Streator Motor Car Co., of Streator, Ill., maker of Halladay cars, has been in the receiver's hands and out again. A financial storm that threatened has subsided and today the concern finds itself again well established in the saddle, with creditors satisfied, it is declared, by the action of the court and with its old officers still in command.

The Streator company has been doing a big business on a small capital and last Saturday, anticipating possible court trouble from some of the creditors, John C. Barlow and Paul R. Chubbuck, president and vice-president, respectively, of the Streator company, filed a petition in voluntary bankruptcy. Two hours later a creditor presented a petition asking for the appointment of a receiver and Judge Landis named the Central Trust Co. This action was followed Monday by an application by the Streator company, in which it was joined by many of its creditors, asking Judge Landis to vacate the order appointing the receiver.

Preparing for the Big Winter Shows

Few Changes in Allotments Have Been Made in Madison Square Garden, New York—Commercial Exhibit Worries Promoters in That Makers Intend Displaying Larger Trucks

NEW YORK, Sept. 26—During the past week slow progress has been made with reference to the two big shows to be held in January. With regard to the space allotments at Madison Square garden during the exhibit of pleasure cars, the probabilities are that there will be only a few minor changes, but in the truck section of the show the Automobile Board of Trade is in a quandary.

The management is endeavoring to locate the various exhibits approximately as they were staged last year, but owing to the pronounced tendency of many of the companies to make larger trucks than before, the problem of housing exhibits above the main floor is proving a puzzle. The difficulty lies in the inability of the elevators to handle the largest types of trucks. Thus, where a concern that formerly showed small cars in the gallery

and this year wishes to display big ones, something will have to be done to make it possible.

The national show, scheduled for the palace, is making good progress. Already contracts have been made to display the Regal, Waverley, Imperial, Stutz, Abbott, Cole, Crow, Firestone-Columbus, Elkhart, Colby, Great Western, Cortland, Federal, Lippard-Stewart and Universal. In addition to these contracts have been practically closed with the Kissel, Schacht, Lion, Hupmobile, Clarke-Carter, Paige-Detroit and the Hupp Corporation. There will be a fine exhibit of electrics including the Baker, Babcock, Rauch & Lang and Detroit.

It is announced that fully forty makes of pleasure cars are likely to be shown and probably twenty different types of trucks.

The Streator company desired authority from the court to continue the business under its present management, guaranteeing the indebtedness of the concern with mortgage bonds to the extent of \$425,000, which bonds were to be had by President Barlow and Vice-President Chubbuck bonding their personal real estate holdings and giving the company's notes for 1, 2, 3, 4, and 5 years, which terms, they stated, were perfectly satisfactory to the majority of the creditors. Judge Landis, taking advantage of the amendment to the bankruptcy act of 1910, today discharged the receiver.

"It was the first case presented in this jurisdiction since the amendment of the bankruptcy act in 1910," said Mr. Chubbuck today, discussing the courts action. "We did not ask to be adjudged bankrupt, but simply that a meeting of our

creditors be called to prove up their claims, and that at such meeting they proposed to submit to the creditors the proposition of accepting the bonds in payment of their claims against the motor company. Under the amendment referred to, a bankruptcy court in a case of this kind has the authority, where a majority of creditors in number and amount agree to accept such a proposition, to compel the minority also to accept. Such proceedings are common in England."

It is understood that a meeting of the creditors will be called in about 10 days. While no formal statement has been made, it is claimed that the Streator Motor Car Co. has assets of about \$750,000 and owes some \$300,000. The proposed plan will put the company entirely out of debt, it is asserted. In the meantime it will operate as heretofore.



BANQUET GIVEN CHARLES Y. KNIGHT AT NEW YORK ATHLETIC CLUB

Engineers Book for European Trip

Many Prominent Men of Industry Agree to Join Society's Party That Will Visit Continental Points—Yankees Probably Will Sail November 1—Additional Attractions Offered

NEW YORK, Sept. 27—The prospects are very good for the size and success of the trip the members of the Society of Automobile Engineers will take abroad during November, to view the show at Olympia, London, and leading car factories in England and France, and to participate in meetings with the Incorporated Institution of Automobile Engineers; on November 11 the British Society of Automobile Engineers will give the S. A. E. visiting members a dinner; and on November 8 there will be a joint technical meeting, at which an S. A. E. member will present a paper.

The party will probably sail on a steamer leaving New York November 1, and the program outlined will take up just about the whole month of November, including the return journey home. The following have signified their intention of making the trip; many of them will be accompanied by their wives: Henry Souther, president of the society; Howard E. Coffin, past president of the society; D. G. McDiarmid, superintendent and designer, C. P. Kimball & Co., Chicago; William E. Metzger, secretary and treasurer, Metzger Motor Car Co.; William Kelley, vice-president and engineer, Metzger Motor Car Co.; J. G. Vincent, chief engineer Hudson Motor Car Co.; A. R. Miller, Bartel, Daly & Miller; John S. Clarke, vice-president Autocar Co.; B. B. Bachman, engineer Autocar Co.; David S. Ludlum, president Autocar Co.; G. R. Wadsworth, assistant to president Peerless Motor Car Co.; A. J. Myers, engineer G. & A. Carburetor Co.; G. B. Von Rottweiler, manager and chief engineer, Falls Machine Co.; H. L. Davisson, engineer Edison Storage Battery Co.; L. C. Marburg, secretary and treasurer Marburg Brothers; Coker F. Clarkson, secretary Society of Automobile Engineers.

DETROIT TRADE GOSSIP

Detroit, Mich., Sept. 25—The indignation of the north end citizens over the attempted erection of a mammoth motor car plant at Woodward avenue, adjoining the fashionable Boston boulevard, by the Herreshoff Motor Co., has taken tangible form. As the outcome of a mass meeting in the North Congregational church, Friday night, a corporation is being formed to acquire the property and turn it over to the city for a park, under an act passed by the last legislature. This corporation will endeavor to purchase the land from the Herreshoff company at what it considers a fair price. Failing in this, the law provides for the appointment of arbitrators to fix a price, which practically

amounts to condemnation proceedings. Incorporators are J. L. Hudson, prominent merchant, and a stockholder in the Hudson Motor Car Co.; J. Walter Drake, president of the Hupp Motor Car Co.; John F. Dodge, of Dodge Brothers, manufacturers of motor car parts; E. A. Lovely, real estate dealer, and C. H. Wills, of the Ford Motor Co. These men have pledged enough money to purchase the property. In addition, \$3,000 has been pledged by other north end citizens. The incorporation papers are to be filed in Lansing today and the Herreshoff company will be given a reasonable time in which to name a price for its land.

Under the law, the incorporators stand practically in the position of trustees of the property acquired in this way and cannot derive any pecuniary benefit from their transactions. This is the first time the act has been taken advantage of and there is some talk of the Herreshoff company's challenging its validity. The probability is, however, that another site will be chosen. The Northwestern Business Men's Association has invited the company to locate out Grand River avenue but the company is disposed to remain on Woodward if another desirable location can be found. In the meantime, the excavating for the foundations of the plant goes merrily onward.

In reply to the injunction bill filed by the Hupp Motor Car Co. last week, R. C. Hupp, of the Hupp Corporation, manufacturer of the new R. C. H. roadster, has given out the following statement:

"In view of the pleasant relations which have always existed between the Hupp Motor Car Co. and myself, I am very much surprised indeed to hear of this action. They have known for several months of my intention to place upon the market a new gasoline car, and of the fact that it would be marketed by the Hupp Corporation.

"In the naming of the new car, I was careful to avoid choosing a name that would conflict in any way or tend to injure the business of the Hupp Motor Co., and, although the name, R. C. H., is my own initials, it does not seem to me there is anything in the name of the new car to which the other concern could take exceptions.

"The Hupp Corporation was named for my brother, L. G. Hupp, who was in active charge at the outset. Since severing my connection with the Hupp Motor Car Co. in August, I have been devoting my entire time and attention to the affairs of the Hupp Corporation. Neither

my brother nor myself, nor anyone by the name of Hupp is now connected with the Hupp Motor Car Co. We have notified the Hupp Motor Car Co. that we shall be unable to manufacture any more parts for its car after November 1. We are planning to market 10,000 new R. C. H. cars during the season of 1912, and our facilities here will be taxed to the limit in turning out our own product."

Mr. Hupp announces that the Hupp Corporation also will manufacture a five-passenger touring car with a 110-inch wheelbase, and a 1-ton truck will be added to the line in 1912.

The boom condition that now obtains in the industry is reflected in the want ads of the local dailies. The Chalmers Motor Co. wants operators for screw machines, lathes and milling machines, grinders, National Acme operators, inspectors, blacksmith and metal pattern makers. The Briscoe Mfg. Co. is advertising for radiator testers, and the Hupp Corporation is in need of a first-class tool designer. The Fiat company, of Poughkeepsie, N. Y., is advertising here for toolmakers, and the Nordyke & Marmon Co., of Indianapolis, is seeking a first-class draftsman on tool and fixture work among Detroit's skilled mechanics. The Studebaker Corporation wants Landis grinders for the night shift in its E-M-F factories.

NEW TRUCK COMBINATION

Chicago, Sept. 25—The International Motor Co., with headquarters in New York City, is the title of a new holding and sales company formed by the interests controlling the Saurer Motor Co. and the Mack Brothers Motor Car Co., of which C. P. Coleman, president of the Saurer company, is at the head. The International only was formed last week, and so far there has been no announcement as to the officers or the capitalization.

The organization of the International company marks a departure in commercial motor vehicle circles in that it brings together the Saurer and Mack interests. The new concern, it is said, will act as a sales agent for the two lines of trucks, the idea being that both will save in the expense of marketing their product without in any way interfering with the methods of the two companies as at present constituted. Each will retain its individuality, but the two lines will be marketed by the International company. The combination gives a line of American-made trucks up to the tonnage capacity of the smallest of the Saurers, and the combination now has a line that extends from 1 to 7 tons, inclusive.

RULING IN GAS TANK CASE

Binghamton, N. Y., Sept. 24—A recent decision of the supreme court of the state of New York has to do with the refilling of one make of acetylene storage tank with the product of another concern. The

Prest-O-Lite Co. sought to enjoin Howard W. Brown, a Searchlight dealer here, against selling Searchlight gas in Prest-O-Lite tanks. A temporary injunction was granted, but when the case came to trial and a permanent injunction was sought at a special term of the supreme court of the state, Judge Lyon vacated the temporary injunction and denied the prayer for a permanent injunction.

The evidence showed that Brown sold to a customer a Prest-O-Lite tank which he had refilled with Searchlight gas, pasting over the Prest-O-Lite nameplate a paper label stating the name of the gas it contained. The plaintiffs sought to invoke the state law which prohibits the refilling of milk bottles, and thereupon brought suit against Brown to recover damages of \$5,000. In his decree denying the injunction Judge Lyon held that the owner of the tank could refill it with anything he desired and that the dealer was within his rights in putting other gas in the tanks made by the plaintiff, providing there was no intent to deceive as to the contents. That there was no intent to deceive was held proven by the fact that the dealer labeled the tank with a notice as to the contents.

SIXTY-SEVEN IN GLIDDEN

New York, Sept. 27.—There are now sixty-seven entries filed for the Glidden tour. Those entering during the past week are as follows: L. C. Brown, Athens, Ga., Mitchell; P. D. Sandlin, Jasper, Fla., Cadillac; Bishop & Varney, Athens, Ga.; Maxwell; J. J. Howard, Jacksonville, White; L. C. Denmark, Jacksonville, Cadillac; R. S. King, Arcadia, Fla., Cadillac; Carolina Portland Cement Co., Atlanta, Ford; E. M. Willingham, Atlanta, Ford; J. O. Teasley, Alpharetta, Ga., Ford; C. A. McCordle, Indianapolis, E-M-F, and Athens Motor Co., Athens, Columbia. Besides these the Marathon company of Nashville has entered six cars, three making a team in the touring car class, and three a team in the roadster division.

SAVANNAH PREPARES FOR RACES

Savannah, Ga., Sept. 25.—After a month's work on the course by the Savannah Automobile Club, the grand prix racing circuit is in grand condition and almost ready for the November meeting. Now comes the news that the Fiat and Benz teams will be in Savannah by the middle of October. The Benz trio will be composed of Victor Hemery, Billy Knipper and Bob Burman.

BUFFALO HOLDS GYMKHANA

Clarence, N. Y., Sept. 24.—The second annual outing and gymkhana games of the Automobile Club of Buffalo were held here today with an attendance of more than 1,500. The principal item of the program was the awarding of the Laurens Enos sweepstakes and other trophies to the winner's of the club's recent reliability.

Racing Dates Are Awarded Speedway

Indianapolis Asks for June 1 and Labor Day On 1912 Calendar—Early Event Likely To Be Repetition of 500-Mile Contest for \$50,000 Purse—Marmon Sending Team to Pacific Coast

INDIANAPOLIS, Ind., Sept. 27.—Definite assurance of two big racing dates at the Indianapolis speedway for the 1912 season was received yesterday when a letter from Chairman S. M. Butler of the American Automobile Association contest board announced that the dates of Saturday, June 1, and September 2, Labor day, had been reserved for the brick track. Complete plans are not announced by the management of the speedway, but it is believed that a second 500-mile international sweepstakes race will be staged on the earlier date. It has been stated that the purse for the next long grind will be greater than that before, probably \$50,000.

Preliminary announcement of the race will be sent out to the manufacturers by the speedway within the next 30 days. This announcement will be followed later by the entry blanks.

The program for the later date has not been planned on at all, but the speedway people are hunting for a race of an entirely different type than any other heretofore staged in this country. Just what they will be able to invent is a matter of much conjecture.

It is announced that the Marmon will be represented by four cars in the Santa Monica road race October 14. Joe Nikrent, of California, will drive one and Joe Dawson another. Ray Harroun will manage the team.

Racing gossip has it that Charles Basle will drive a Cole in the Fairmount Park road race, while Harry Knight will be the Cole representative at Savannah.

The Fiat team at Savannah will be made up of five men. Nazzaro, Bruce-Brown and Bragg will drive in the grand prix, while Bruce-Brown, Parker and Tetzlaff will be in the Vanderbilt.

ROAD RACING AT OSTEND

Brussels, Sept. 6.—The road racing at Ostend was of a mediocre quality. The attendance was poor and the entry list skimpy, while the racing was far from being exciting. The four events—the Liedekerke, Williams, Ostend and voiturette cups—were run as one and the racing was somewhat of a joke. The distance for all was supposed to be 248.4 miles, or twelve laps, but when Boillot in the Lion Peugeot finished ten circuits and was 20 minutes to the good, he deliberately stopped and claimed he had won. He convinced the judges that it was unnecessary for him to go the remaining two laps and they gave him the verdict and awarded him both the Williams and Ostend trophies. His time for the 207 miles was 3:28:33. The voiturette race was won by Goux, also in a Lion Peugeot, in 3:52:38. It was

ruled that Verhaegen in the Fondu, the only one left in the Liedekerke cup, had to go the full twelve laps, and he rambled along to the end in 6:12:00.

Ten cars started in the four races. The Liedekerke was for four-cylinder cars of 2.95-inch bore and 4.7-inch stroke, and besides the Fondu there also started two D. S. P. L. cars, Guyot driving one and Count d'Hespel the other. Guyot quit in the third lap and the count never finished the first circuit. Goux and Zucarrelli in Lion Peugeots started in the voiturette race. Goux won and his team mate went eight laps. Boillot in a Lion Peugeot, Christians and Coosemans in Excelsiors and Esser in a Mathis started in the Williams cup, for cars of 3.5 inch bore. The same field, with the addition of Simon in a F. L. F., ran in the Ostend trophy race. Christians went three laps, Coosemans finished in 3:45:55, Simon went nine laps and Esser finished eight.

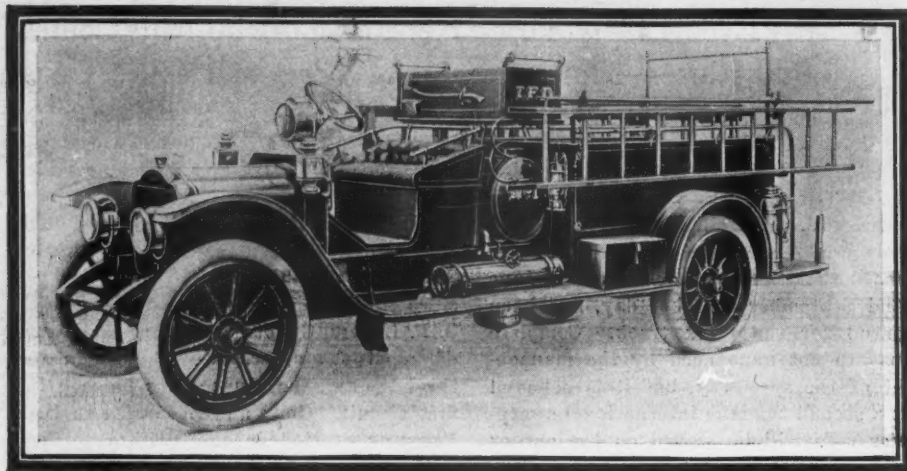
AFTERMATH OF SYRACUSE ACCIDENT

Syracuse, N. Y., Sept. 23.—Lee Oldfield, whose racing car crashed into the crowd at the state fair grounds last Saturday and killed eleven persons, appeared before Coroner George R. Kinne yesterday to testify to conditions leading to the accident. Though for several days his nerves were totally unstrung, and at one time the hospital attendants feared for his reason, he was much improved yesterday, though much affected while giving testimony.

At the inquest Oldfield gave his age as 22, his residence as Wilkes Barre, Pa., and stated that he was married and had an infant daughter. The driver placed two licenses in evidence to show that he was considered competent to pilot a car. The tire that burst and caused the accident was thoroughly examined, there being a gash of almost a foot in the shoe and a rent of about equal length in the inner tube. Oldfield admitted it was worse than he realized, but said that such a condition might exist on the inside and yet have the outer tire apparently sound.

In regard to the mooted question of whether Oldfield was signaled to increase his speed, he said that his manager, E. A. Moross, signaled him to that effect after completing his thirty-ninth mile. Till then he had been shutting off his power right after leaving the grandstand, to make the turn in safety on the mile course; but after getting the signal, he went as far as the bend without shutting off the power. He testified that the tire that burst was the one that was getting the most strain, being the first to hit the embankment on the cut across.

Motor-Driven Fire-Fighting Apparatus



KANAWHA AIR-PRESSURE CHEMICAL ON WHITE CHASSIS

MILWAUKEE, WIS., Sept. 22—Motor-driven fire apparatus was the feature of the thirty-ninth annual convention of the International Association of Fire Engineers which closed here today. In fact, it was generally remarked that the parades and the exhibition at the Auditorium were as much a show of motors as of strictly fire-fighting equipment.

Of the twenty exhibits of fire-fighting apparatus there only was one that was not gasoline-propelled and only two pumping engines that were not operated by gasoline. One was a steamer, which was a converted horse-drawn type. In the pumping engine tests only gasoline-driven pumps took part.

Although the official pumping tests were not competitive, it would seem from the results given in the official report that the big double-six of the America-La France Fire Engine Co. made the best showing. This was to be expected as the car was the largest in the field. It has two six-cylinder motors of approximately 100 horsepower each and both are coupled to the pump at the same time. It discharged 262 gallons per minute through 1,000 feet of 2½-inch hose with a 1¼-inch ring nozzle at a net pressure at the pump of 275 pounds. This, in spite of the fact that one of the motors was missing badly, due, it seemed, to faulty ignition and too small a carburetor. The official report of tests of pumps was as follows:

Test No. 1—American LaFrance Fire Engine Co., Elmira, N. Y. Double motor, six cylinders each, pumping car, horsepower of motor, 200; cylinders, 5½-inch bore, 6-inch stroke, pump capacity 800 to 900 gallons per minute. Discharged 262 gallons per minute through 1,000 feet of 2½-inch hose and 1¼-inch ring nozzle. Pump pressure, 270 pounds; suction pressure, 5 pounds; net pressure, 275 pounds; nozzle pressure, 56 pounds; duration of test, 7 minutes.

Test No. 2—American LaFrance Fire Engine Co., Elmira, N. Y. Same machine as in test No. 1. Discharged 322 gallons per minute through 1,000 feet of 2½-inch hose and 1¼-inch smooth nozzle. Pump pressure, 275 pounds; suction pressure, 5 pounds; net pressure, 280 pounds; nozzle pressure, 23¼ pounds; duration of test, 15 minutes.

Test No. 3—American LaFrance Fire Engine

Co., Elmira, N. Y. Same machine as in tests Nos. 1 and 2. Discharged 645 gallons per minute through two 500-foot lengths of 2½-inch hose, with one 1¼-inch smooth nozzle, and one 1¼-inch ring nozzle. Pump pressure, 225 pounds; suction pressure, 5 pounds; net pressure, 230 pounds; nozzle pressure, 79 pounds; duration of test, 5 minutes.

Test No. 4—American LaFrance Fire Engine Co., Elmira, N. Y. Same machine as in tests Nos. 1, 2 and 3. Discharged 825 gallons per minute through four 100-foot lines of 2½-inch hose, slamed into a deluge set with 1¼-inch nozzle. Pump pressure, 100 pounds; suction pressure, 7 pounds; net pressure, 107 pounds; nozzle pressure, 82½ pounds; duration of test, 5 minutes.

Test No. 5—American LaFrance Fire Engine Co., Elmira, N. Y. Four-cylinder motor pumping car. Horsepower of motor, 70; cylinders 5½-inch bore, 6-inch stroke; pump capacity, 450 to 500 gallons per minute. Discharged 264 gallons per minute, through 1,000 feet of 2½-inch hose, and 1¼-inch smooth nozzle. Pump pressure, 216 pounds; suction pressure, 5 pounds; net pressure, 221 pounds; nozzle pressure, 49½ pounds; duration of test, 5 minutes.

Test No. 6—Same machine as No. 5. Discharged 444 gallons per minute through two 500-foot lines of 2½-inch hose, each with ¾-inch smooth nozzle; pump pressure, 166 pounds; suction pressure, 6 pounds; net pressure, 172 pounds; nozzle pressure, 96 pounds; duration of test, 5 minutes.

Test No. 7—American LaFrance Fire Engine

Remarkable Exhibition Made at Milwaukee—Twenty Concerns Displayed Latest Ideas, Mostly of the Gasoline Type

Co., Elmira, N. Y. Six-cylinder motor pumping car. Horsepower of motor, 100; cylinders, 5½-inch bore and 6-inch stroke; pump capacity, 600 to 700 gallons per minute. Discharged 249 gallons per minute, through 950 feet of 2½-inch hose, and 1¼-inch smooth nozzle; pump pressure, 188 pounds; suction pressure, 3 pounds; net pressure, 191 pounds; nozzle pressure, 44½ pounds; duration of test, 5 minutes.

Test No. 8—Same car as No. 7. Discharged 425 gallons per minute through two 500-foot lines of 2½-inch hose, and ¾-inch smooth nozzle; pump pressure, 153 pounds; suction pressure, 3 pounds; net pressure, 156 pounds; nozzle pressure, 89 pounds; duration of test, 5 minutes.

Test No. 9—The Ahrens-Fox Fire Engine Co., Cincinnati, O. Six-cylinder motor pumping car. Horsepower, 72. Pump capacity, 400 to 500 gallons per minute. Discharge 244 gallons per minute through 1,000 feet of 2½-inch hose, and 1¼-inch smooth nozzle; pressure, 185 pounds; suction pressure, 5 pounds; net pressure, 190 pounds; nozzle pressure, 42½ pounds; duration of test, 15 minutes.

Test No. 10—Same machine as No. 9. Discharged 340 gallons per minute through two 500-foot lines of 2½-inch hose, with ¾-inch smooth nozzle; pump pressure, 93 pounds; suction pressure, 4 pounds; net pressure, 97 pounds; nozzle pressure, 56½ pounds; duration of test, 5 minutes.

Test No. 11—Webb Motor Fire Apparatus Co., St. Louis, Mo. Six-cylinder motor pumping car. Horsepower, 80; cylinders, 5½-inch bore, and 5½-inch stroke; pump capacity, 600 gallons per minute. Discharged 246 gallons per minute through 1,000 feet of 2½-inch hose and 1¼-inch smooth nozzle; pump pressure, 170 pounds; suction pressure, 3 pounds; net pressure, 173 pounds; nozzle pressure, 43 pounds; duration of test, 3 minutes. Test of this car discontinued on account of lubricating device not working satisfactorily.

Test No. 12—Same company as No. 11. Another car, six-cylinder, horsepower, 80. Cylinders, 5½-inch bore and 5½-inch stroke. Pump capacity, 600 gallons per minute. Discharged 224 gallons per minute through 1,000 feet of 2½-inch hose and 1¼-inch smooth nozzle; pump pressure, 157 pounds; suction pressure, 4 pounds; net pressure, 161 pounds; nozzle pressure, 36 pounds; duration of test, 5 minutes.

Test No. 13—Same car as test No. 12. Discharged 361 gallons per minute through two 500-foot lines of 2½-inch hose and ¾-inch



REAR VIEW OF SEAGRAVE AERIAL LADDER TRUCK

Inspected by Many Fire Department Chiefs

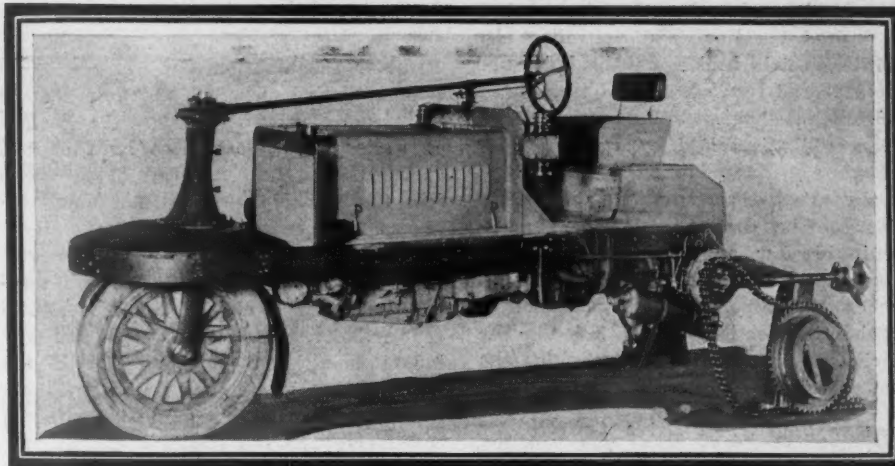
Official Pumping Tests Are Held Which Are Productive of Results that Testify to the Superiority of Motor Engines

nozzle; pump pressure, 113 pounds; suction pressure, 6 pounds; net pressure, 119 pounds; nozzle pressure, 63½ pounds; duration of test, 7 minutes.

Test No. 14—Same car as tests Nos. 12 and 13. Discharged 589 gallons per minute through two 100-foot lines of 2¼-inch hose, siamesed into a deluge set with 1½-inch nozzle; pump pressure, 68 pounds; suction pressure, 9 pounds; net pressure, 77 pounds; nozzle pressure, 42 pounds; duration of test, 5 minutes.

Exhibits of motor-propelled fire apparatus included a 90-horsepower aerial truck and three combination chemical and hose cars built by the Seagrave Co.; two pump, hose and ladder cars of Robinson manufacture; an automatic extension ladder and two combination hose and chemical cars in the Webb stand; the 200-horsepower double-six pump, three single-engined American LaFrance pumps and two combination cars from the LaFrance Co. In the Rambler exhibit were two combination cars, one with one chemical tank and one with three, and a chief's runabout. There was the new Kanawha chemical engine fitted to a White 1½-ton chassis. The Knox showed the monster motor fire engine in use in New York city. Another pump and hose car was exhibited by the Ahrens-Fox Co., and the Nott motorized steamer was shown beside a horse-driven steamer to make plain the improvement. A Grabowsky 3-ton chassis was shown and is to carry one of the standard makes of fire apparatus next year.

Among the fire engines the one that caused the most comment was the big



MARTIN TRACTOR TO MOTORIZED HORSE-DRAWN APPARATUS

200-horsepower pump of the American LaFrance Co. This consists of a very heavy frame carrying two six-cylinder motors, one in the front and the other in the rear, and a fire pump, which has a capacity of from 800 to 900 gallons of water per minute. The two motors are practically the same in construction, the only difference being that the rear one is built to run normally at a speed of 1,000 revolutions per minute whereas the forward motor runs at 1,200 revolutions.

Either forward or rear motor is used alone for the propulsion of the car, the other one being coupled to the pump after the scene of the fire is reached. Either forward or rear motor, or both together, can be used to drive the pump. The motors are separately controlled and connection is made to the pump by means of jaw clutches. The six cylinders of each motor

have a bore of 5½ inches and a stroke of 6 inches. The motors are of the T-head type. A large fan, belt-driven from the camshaft on the left side of the motor, assists the honeycomb radiator in cooling. A feature of the cooling is an auxiliary water tap from the fire pump to the waterjackets by which cold water is supplied to the system when the fire pump is working. A gear-driven circulating pump is also employed.

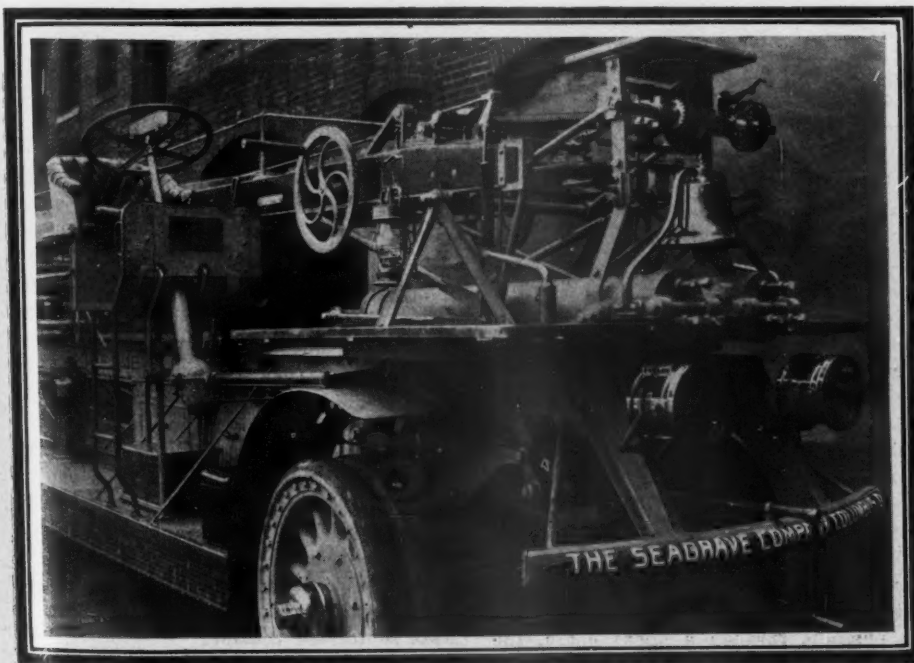
Webb Gas-Electric Aerial Ladder

The Webb Motor Fire Apparatus Co. exhibited an automatic aerial extension ladder truck with four-wheel drive and four-wheel steer. In this the Couple-Gear combination of gasoline and electric drive is employed. A gasoline motor is used to drive an electric generator which in turn furnishes power to the motors which propel the car and also to motors which operate the 75-foot extension ladder and the turntable. The generator in addition supplies current to the powerful searchlight mounted on the car.

The gasoline motor has four cylinders of 5¼-inch bore and 6-inch stroke. It is of the T-head design with the cylinders cast in pairs. Bosch dual ignition is employed and the circulation of the cooling water is maintained by means of a pump gear driven from the engine. On the shaft of the gasoline engine is the 12.52 kilowatt generator. It has a maximum capacity of 300 amperes and the voltage can be varied from 25 to 200 although the generator is rated at 100 volts at a speed of 800 revolutions per minute.

The motors for the propulsion of the truck are located in the wheels. Each wheel of the truck is made up with a very flat bipolar motor inclosed between two steel disks. The back of the field casting connects through a steering knuckle to the rigid axle which supports the wheel. The two rear wheels are steered separately from the front ones.

Current to the motors is regulated by



FRONT OF SEAGRAVE AERIAL LADDER TRUCK

a controller in addition to the throttle control so that a number of speed variations are obtained. There is a separate controller for the ladder hoist and for the turntable by which the ladder is swung in the desired direction. The controllers also operate electric brakes on the hoist and the front and rear wheels and there is an additional mechanical brake on the wheels.

The ladder is raised by a small motor through a gear reduction of 350 to 1. Supplementary barrel springs allow the ladder to be gradually lowered and a circuit breaker automatically stops the latter and sets the electric brake when it reaches the top point. The truck frame is of channel section, wood filled. The wheelbase is very long, 24 feet from the front wheels to the rear wheels.

Seagrave Four-Wheel Drive Aerial

Another extension ladder truck in which were shown the four-wheel-drive and four-wheel steer features is the Seagrave aerial ladder. The ladder itself is 85 feet in length when extended and the truck as a whole weighs 10 tons. The four-wheel-drive in this case is obtained by means of a propeller shaft from the motor to the floating front and rear axles which have knuckle-type of universal joints to allow of turning the wheels in steering. The motor has six cylinders, 5¼ inches bore and 6 inches stroke. Lubrication is obtained by means of a mechanical oiler, and the ignition system is double with Bosch magneto and storage battery as sources of current. The tires are dual solids 40 by 4 inches in size and are spaced 66 inches from center to center. The ladder is raised by means of barrel springs and lowered by a hand crank through a train of gears. The frame is in the form of a box, the lower part being the frame proper of the truck and the upper portion supporting the superstructure, which carries the ladder. Both are of channel section, the upper 7 inches deep and the lower 5 inches deep, reinforced with web plates.

Knox Six-Cylinder Pump

One of the features of the exhibit was the big 120-horsepower pumping engines made by the Knox Automobile Co. that is in the service of the fire department of the city of New York. It is said that the car will make 40 miles an hour on the road and will throw 1,000 gallons of water per minute at a pressure of 200 pounds. The six cylinders are cast in pairs and are 6½ by 7½ inches in size. The two-cylinder pump is driven by silent chain from the motor.

The Martin tractor, a single-wheeled motor device, may be attached to the front axle of any piece of apparatus designed to be horse-drawn. By its use, cities that have horse-drawn apparatus can change it to motor-driven equipment without discarding the old pieces. The tractor consists of the Knox motor mounted upon a frame which has a single wheel at the front for the forward support and steering. The rear of the frame ends in

two long flat springs which are fastened at their rear ends to the axle of the horse-drawn truck. Power from the motor is transmitted to a jackshaft and from that by double chain to sprockets on the front wheels of the truck.

Rambler Combination Car

Combination chemical and hose wagons were shown in two forms by the Thomas B. Jeffery Co. Both were built on the same chassis, but one had three chemical tanks and the other had one. Although the chassis used for the Rambler municipal service cars is especially built for that purpose, the standard touring car motor is employed. It is of the four-cylinder, water-cooled type, the cylinders being cast separately with the heads, valve pockets and water jackets cast integrally. The bore of the cylinders is 5 inches and the stroke 6 inches.

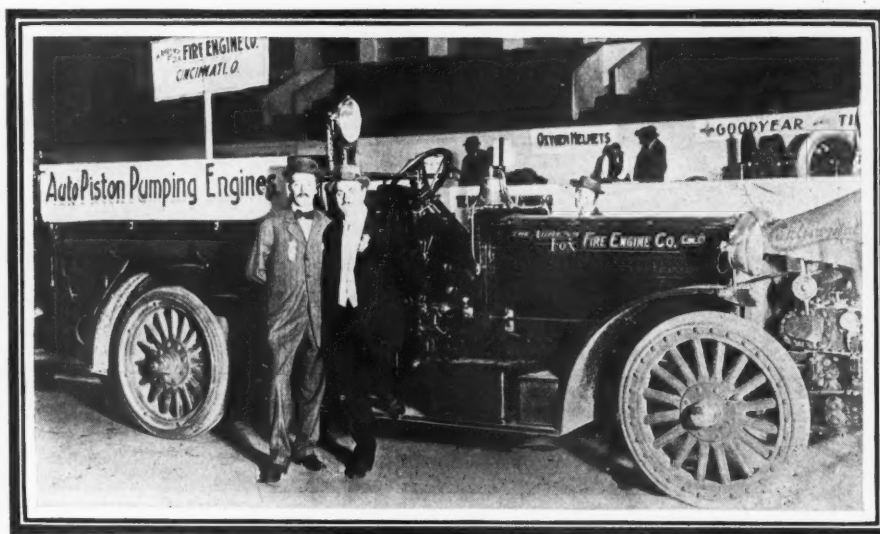
Robinson Motor Fire Engine

The Robinson Fire Apparatus Co. has long been engaged in the production of

four inlet or suction valves and eighteen discharge valves. Water can be taken in or discharged at either side. The frame of the fire engine is 17 feet from end to end built of 5-inch channels. Front springs are 39½ by 2¼ inches semi-elliptic front and rear. In addition to the pump the outfit carries 1,200 feet of 2½-inch hose and a 40-gallon chemical tank.

Ahrens-Fox Motor Pump

One of the fire engines which has a novel construction is the Ahrens-Fox motor-pump and hose wagon. The general arrangement and construction is the same as the other motor-driven fire pumps except in the location of the pump itself. This is installed in front of the radiator on a sub-base attached to the front springs, and is driven from a forward extension of the crankshaft. Solid tires are employed, 40 by 4 inches in size, single in front and dual on the rear wheels. The motor had six cylinders and developed 72 horsepower. The pump has a



AHRENS-FOX MOTOR FIRE ENGINE

horse-drawn apparatus and exhibited two models of a new gasoline motor fire engine. It is equipped with a gasoline motor and a triple-piston pump which is said to discharge 750 gallons per minute. A six-cylinder Buffalo motor, 6¼ by 6¾ bore and stroke, is used. This is of the L type with inlet valves 2½ inches and exhaust 2¾ inches in diameter. The cylinders are cast in pairs with integral waterjackets and the valves placed in overhanging pockets. The motor is water cooled, a by pass from the fire pump permitting a flow of cold water through the jackets when it is working. The radiator is mounted on rubber strips to absorb shocks. Lubrication is by means of force feed oiler.

A 3 to 1 gear is used in the starting crank to reduce the effort in turning the motor over. The drive from the shaft to the pump is through a silent chain, the pump being back-geared. The triple-piston pump is made of bronze and steel and weighs 1,000 pounds. There are twenty-

capacity of from 400 to 500 gallons of water per minute.

Kanawha on White Chassis

A 1½-ton White chassis was shown as the transporting part of a Kanawha air-pressure chemical fire engine. The latter consists of a chemical tank to which are attached one or more cylinders containing compressed air which forces the chemical through the hose and onto the fire. The heat of the fire transforms the chemical solution into carbonic acid gas or other fire-fighting gas. This differs from the ordinary chemical tank in that none of the chemical action is used for the propulsion of the stream of liquid. The engine is mounted upon the standard White chassis, with its four-cylinder enbloc motor, four-speed gearset and shaft drive. The cylinder dimensions are 3¾-inch bore and 5½-inch stroke.

Nott Motorized Steamer

In the Nott exhibit was shown this company's method of converting horse-drawn fire apparatus into motor-driven

apparatus. In this instance the motor is applied to a large steam fire engine. The conversion consists in placing the steam boiler, pump and the supplementary equipment upon a chain-driven chassis in which the heavy drop frame and very high wheels of the original horse-drawn engine are retained. The gasoline motor is located forward of the driver's seat in the usual way.

Grabowsky Fire Chassis

Among the newcomers in the field of fire apparatus is the Grabowsky Power Wagon Co., which exhibited a chassis with a four-cylinder motor. This type of chassis is to carry the line of fire-fighting apparatus made by one of the large manufacturers of fire equipment.

This motor is arranged to have a removable power plant. The latter is mounted on a 3-inch channel subframe which slides in the angle iron of the forward part of the main frame. The removal of four bolts and disconnection on

conveyance for postmen. There were five makes of cars exhibited, two of which were equipped with bodies especially designed for the use of rural delivery mail carriers. Among the cars shown were the Paige-Detroit, Schacht, I-H-C, and others.

Evidence of preparation for the parcels post was shown in the space of the Gasoline Mail Car Co. The feature of this exhibit was a metal body designed for the delivery of mail and parcels on rural routes. The body was fitted to an I-H-C chassis. It is made of galvanized steel and contains five cabinets, each of which is provided with pigeon holes. There is in addition a large receptacle for newspapers and magazines.

SERVICE CARS AT MUNICIPAL SHOW

Chicago, Sept. 25.—Motor cars are in evidence in the Coliseum this week during the international municipal congress and exposition here. Over half of the

horse-drawn apparatus into motor equipment, and finally a steamer in the service of the city of Birmingham, Ala., which had been motorized by the Nott Fire Engine Co.

RECEIVER FOR FINDLAY COMPANY

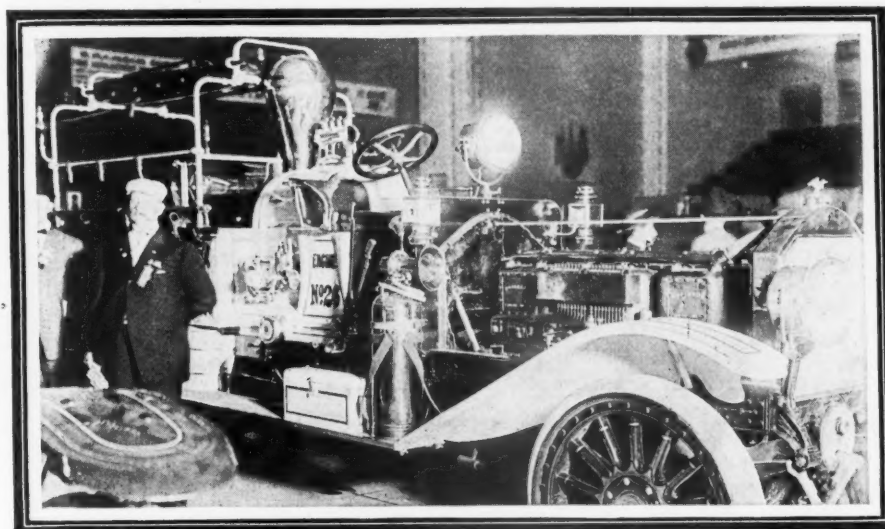
Findlay, O., Sept. 23.—The Ewing-American Motor Works of this city has gone into the hands of a receiver, John M. Barr, of Findlay, being named. The appointment was made by Judge Killitis in the United States court at Toledo, late last Wednesday. The Findlay Motor Co., the original company, is defendant. It is stated that the suit is a friendly one, the company not having enough working capital, and is in debt something like \$50,000. The company is neither insolvent nor bankrupt, according to the petition, but needs additional capital to take care of the business now on hand. The plaintiff company thought a receiver would be better for the defendant company and the creditors and the action was agreed to by the representatives of the company here.

The plant has closed down, and it is not known how soon it will open again. At one time more than 200 men were employed, and within the past year the Lockport Stamping Works and the American Motor Works, both of Lockport, N. Y., were removed here and consolidated with the Findlay Motor Works, and later the Ewing-American Works was the outcome. The new company was incorporated under the laws of New York with a capital stock of \$1,500,000.

NO SHOW FOR FRISCO

San Francisco, Cal., Sept. 18.—Announcement is made by the Motor Car Dealers' Association of San Francisco that no gasoline pleasure vehicle show will be held in this city by them or under their sanction. This means that there will be no show this season, for after the unpleasant experience of private promoters who attempted to hold an exhibition last March against the wishes of the association, it is not probable that any such will be attempted again. At that time the organized dealers published several announcements that they were not participating, and this, combined with bad weather, resulted in serious financial losses to the promoters.

The decision of the Motor Car Dealers' Association not to hold a gasoline pleasure vehicle show leaves open the question of an exhibition of electric vehicles and motor trucks. This matter is to be taken up at a later date, and it is not improbable that a display of commercial vehicles will be gotten up. The truck is just getting a strong foothold in this territory, and many dealers believe that this is an auspicious time to impress its advent upon the business man by an exposition in which all the principal cars shall be represented. It is believed that the exhibition could be made very educational.



ROBINSON MOTOR PUMP AND HOSE WAGON

the water, gas and electrical connections permits it to be pulled forward out of the chassis. The motor is of the L type with the valves on the lefthand side.

The motor has cylinders of 5¼ inches bore and 5¾ inches stroke. A housing completely encloses the clutch and gear-set which with the motor form a unit power plant. A fly-ball governor regulates the speed of the motor automatically.

Drive is by double chain to the rear wheels. The differential in the jackshaft is provided with a lock by which it is thrown out of commission. The car is equipped with right-hand steering and left-hand control. The tires are solid, 38 by 6 inches in front and 42 by 6 dual in the rear.

LETTER CARRIERS ENTHUSIASTS

Milwaukee, Wis., Sept. 23.—The national convention of letter carriers which is in progress here this week developed a surprise in the extent to which motor cars had taken the field as a means of

public service vehicles on display are motor-driven, and nearly all types of municipal vehicles are represented.

In the exhibit of the Briggs Labor Saving Specialty Co. there is an 8-foot street cleaner with a rotary broom as well as a 2½-yard rear dump asphalt wagon. Both of these are equipped with Rutenber motors and driven by double chains to the rear wheels. The broom of the street cleaner is rotated by chains from the motor. The Kelly-Springfield Road Roller Co. is showing a gasoline-propelled road roller and in the space allotted to the Chicago police exhibit is a motor-driven ambulance built in the shops of the department.

Fire-fighting equipment represents the largest portion of motor apparatus. In this division is seen a Harder combination chemical, hose and squad truck, two Kanawha chemical wagons on White chassis, the big six-cylinder Knox fire pump in the service of the city of New York, a Martin tractor for the conversion of

Routes and Touring Information

DESIRES TENNESSEE ROUTE

ELGIN, Ill.—Editor Motor Age—Kindly publish route from Nashville, Tenn., to Chattanooga. The route by way of Murfreesboro, Manchester, Monteagle, Tracy City and Jasper is very rocky and bad from Beach Grove to Monteagle, also around Rankin's ferry. I will run from Elgin to Savannah.—H. F.

One route to Chattanooga is by way of Sheffield, Ala., a distance of 119.7 miles, and is a great deal longer than the above mentioned. The Gliddenites traveled over the stretch from Nashville to Sheffield in their 1910 tour and the intermediate towns are Brentwood, Franklin, Spring Hill, Neapolis, Columbia, Ridley, Mt. Pleasant, Sandy Hook, Williamsville, Rockdale Furnace, Crestview, Summer-town, Lawrenceburg, Dunn, Leoma, Pleasant Point, Loretto, Green Hill, St. Florian, Florence and Sheffield. Sheffield to Chattanooga motor to Tusculumbia, Leighton, Town Creek, Courtland, Wheeler, Hillsboro, Trinity, Decatur, Huntsville, Scottsboro, Bridgeport, Jasper and Chattanooga. There is a connecting road between Murfreesboro and Huntsville through Fayetteville which cuts off considerable mileage.

CIRCLES LAKE MICHIGAN

FOSTORIA, O.—Editor Motor Age—I have just driven my 1912 Reo around the shores of Lake Michigan, a trip of 1,700 miles. This route takes in some of the wildest section of the States of Michigan and Wisconsin.

I was the first motorist to drive a car around Lake Michigan. I left Fostoria over 2 weeks ago accompanied by my wife and two children, one 2 years and the other 4 years of age, and my sister, Miss Marjory.

I started north by the way of Lansing, Mich., and from Lansing the trip was



MOTERING PARTY WHICH SUCCESSFULLY COMPLETED 1,700-MILE JAUNT AROUND LAKE MICHIGAN

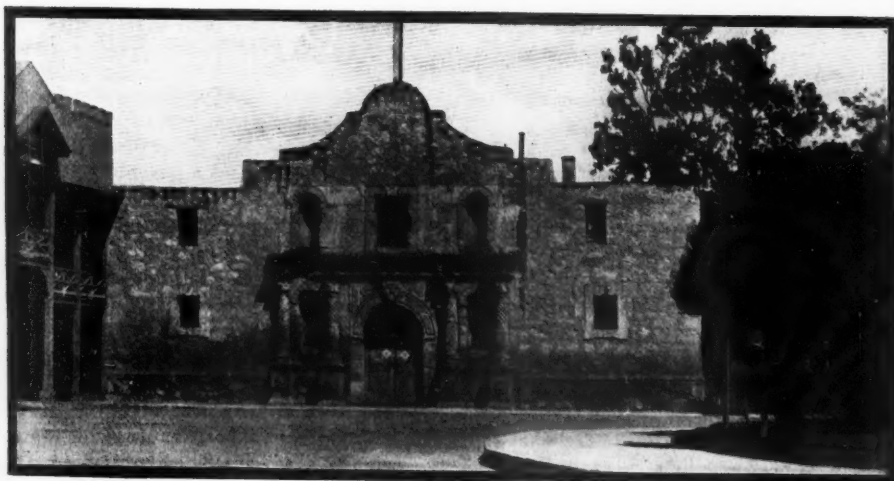
easily made over fairly good roads to Grand Rapids where the party spent the night. The trip was resumed the next morning after an all night's hard rain and considerable water was found on the roads from time to time. The farther north we got the more hills and sand we found. The roads were pretty well graveled up to about 50 miles north of Grand Rapids. Then we found mostly angling sand roads with occasionally a stretch of corduroy and some very steep hills. Toward night we came to the foot of a hill where the bridge leading across a creek was out, made it necessary to drive over some newly laid corduroy and the black muck swamp to get around this bridge. We soon pulled into Cadillac, in the center of the state of Michigan, with about 150 miles to our credit for a days' drive.

Next morning we spent some time in taking in the scenery around Cadillac, and in the afternoon the trip was resumed, heading for Traverse City, on Lake Michigan. The following afternoon's drive was

composed of one hill after another and deep sand, although we found short stretches of macadamized roads. The next day was spent in taking in some of the resorts around Traverse City with the drive over to Provemont, where a number of Fostoria friends are located and there we stopped for lunch. We found this to be a fairly good drive. The trip was continued northward to Charlevoix, Petoskey and Mackinac City. Here considerable time was consumed in crossing straits of Mackinac. The accommodations for taking an auto across the straits are very poor. It was necessary to load my own machine on a flat car and block it down and the railroad company then switched it on the car ferry which plies between Mackinac City and St. Ignace. It was only a short water trip of 5 or 6 miles for which I was forced to pay \$7 for the accommodations, then unload my own car at St. Ignace, where the railroad officials refused to give any assistance. The next day numerous trips were taken in and around St. Ignace and I found that a car never was driven from there to Soo on its own power and was told that it was impossible to get one through without taking a half dozen swamper along to cut down trees and build roads.

We started one morning, bright and early with the little information we could gather as to the roads and were told that a bridge across the Pine river was condemned and would be very dangerous to cross with a car. This had been recently repaired, however, we were able to get across in safety. We had thus far gone along at a pretty good speed, but beyond this bridge the road seemed to end in a large beaver meadow, with no road or wagon track going in either direction. We finally found an opening into the woods which started out over corduroy and had been used for logging years ago. This corduroy road led through a series of cedar and tamarack swamps for a distance of ten miles. The corduroy was as rough as if one were driving up and down over a succession of curbstones. Occasionally we found in places where the corduroy was rotten the car would break through into black muck, but we were successful each and every time to get out of these holes with the power of the engine.

After getting over the corduroy we found very rough country covered with boulders and we would have been unable to get through this had we not such high wheel clearance, which enabled us to pass over the small rocks and boulders. This stretch was through heavy forests and it was necessary to get out and cut down fallen trees in order to pass. At one point we found a hardwood maple, 2 feet



THE ALAMO OF SAN ANTONIO, THE SCENE OF THE BATTLE AND MASSACRE IN THE WAR OF 1830 FOR TEXAN INDEPENDENCE

through, directly across the road with absolutely no way of getting around. I took the ax which I carried along and cut the tree in two, but could not move the log, so I was forced to take block and tackle and pull the log out of the road by the power of the car. And, by the way, an ax, block and tackle and shovel are very important equipment to carry when making a tour in the north; they are absolutely necessary. We soon came to pioneer settlers and civilization again, but the motor car was a curiosity as not one ever had traversed those roads before.

We arrived at the Soo at about 9 o'clock that night after 12 hours of hard travel, covering a total distance of 65 miles, but we were able to congratulate ourselves on being the first motor car driven into Soo on the power of the machine. Next day was spent taking in the American and Canadian Soos; the greatest piece of engineering work next to Panama canal ever put through by this government is going on at the America Soo. The government is putting in a new lock to be the largest enterprise in the world of its kind which will cost \$10,000,000 and will take several more years to finish. We were now headed for Marquette on Lake Superior and found there were no roads at all from Soo towards Marquette, so we shipped our car about 50 miles along the shores of Lake Superior to Grand Marais. Ours was the first motor car ever in the town and the natives told us that we were up against it and could not get out of the town except by boat. We thought differently and headed towards Munising and the picture

rocks of Lake Superior. This was a very wild country with numerous corduroy roads. We found some trouble in getting through beaver meadows on account of the beavers' building dams and flooding the creeks. Beavers are very numerous in this country because of protection of the laws of the state and they have become quite a nuisance to some of the settlers on account of building dams over creeks and backing the water over the few roads.

Next Munising and Grand Island were visited, which is a great forest and game preserve owned by the Cleveland Cliffs Co. Munising has a magnificent harbor with a beautiful background of hills covered by hardwood trees. From here the road led to Marquette, part of which was very well improved, the balance being sand and very poor corduroy.

We arrived at Marquette in good shape and spent the day in drives to Negaunee and Ishpeming. There are beautiful roads around this country, and these two towns are much alive and up-to-date. These towns are kept up by big iron mines in this vicinity. From Marquette we started early one morning on a hard trip through the upper peninsula to Lake Michigan. We passed through a very wild and unsettled country and finally landed in Escanaba after a very hard trip, taking all day to make it. We found there had been very few machines driven along this route. From Escanaba to Menominee, located on Green Bay, we found very good roads. From Menominee to Green Bay the roads were rather poor. From Green Bay we drove to Fondulac, Wis., where we put up

for the night. From there to Milwaukee and Chicago the trip was made over good roads in a day, taking 3 days from Marquette to Chicago, a trip of nearly 600 miles. From Chicago we headed through Illinois and Valparaiso, Ind., on good roads all the way to Fort Wayne, Ind., where we stayed all night. Next day was an easy trip from Fort Wayne, having good roads all the way.

The speedometer registered 1,700 miles on arriving home, and the trip was all made on the power of the machine, except when we had to go via water, as heretofore mentioned. We carried 300 pounds of baggage with us and had our blankets in case of necessity prepared for camping out, but we were able each night to get into some town. The total trip was made without any repairs on the machine and ended with the car running smooth as a clock.

I believe no one will dispute my claim of being the first to drive around Lake Michigan. It was an adventurous trip, but not hazardous, and we all certainly enjoyed it.—Henry J. Adams.

TEXAS ROUTING

Waxahachie, Tex.—Editor Motor Age—Would like the best touring route between Dallas and San Antonio, Tex., returning via Houston.—A Reader.

Leaving Dallas, Motor Age suggests that you motor to Waxahachie, Hillsboro, Abbott, West and Waco; then from Waco to San Antonio, 208 miles, the route lies through Lorena, Bruceville, Eddy, Troy, Temple, Little River, Sparks, Holland, Bartlett, Granger, Georgetown, Round



TWO VIEWS OF THE SAN JOSE, A SPANISH MISSION, WHICH ATTRACTS THE TOURISTS IN SAN ANTONIO. THE ENTIRE FACADE IS SAID TO HAVE BEEN BROUGHT FROM SPAIN TO THE CITY OF MEXICO, THENCE TO ITS PRESENT SITE

Latest Bulletins on Roads from Touring Club of America

LONG ISLAND

FROM the Sea Cliff ferry a direct line runs on a fine oily macadam road through Krug's Corner, Mineola, Hempstead to Rockville Center, where connections can be made east or west on the south shore line.

From Rockville Center to Patchogue the road is in very fine condition.

The road west from Lynnbrook to Jamaica is reported to be in the same bad condition as the north shore road is out of New York.

From New York City to the south shore the rough, worn routes can be avoided as follows: From Queensboro bridge turn right on Jackson avenue to nearly the end of the street, jogging right and next left on viaduct over railroad and Newton creek. Follow Manhattan avenue 6 miles, turning left and immediately right on Leonard street. Continue then, turning left on Scholes street to Bushwick avenue, on which turn right across railroad to a fork in a road with a high stone wall on the left. Turn left on the brick pavement, climbing over the hill, keeping to the right. Turn left on Jamaica avenue—stone block pavement which is not at all rough—into Jamaica. Turn left on Fulton street to the Peace monument, where turn right on Hillside avenue to Queen's road, turning right to the end of road. There turn left and next right through Queen's Court to Hempstead. From Hempstead one can go north to Sea Cliff on a fine oily road or south to Rockville Center on the same kind of a road.

The short stretch on Manhattan avenue is a little rough, being stone block pavement, but it is only a short distance and nothing at all like Jackson avenue or the Hoffman boulevard. This route is by far the easiest traveled from Queensboro bridge to the south shore, and if one is not in a hurry, much preferred to the north shore. It is a little longer than the regular traveled lines.

The route from Queensboro bridge to Huntington, via the north shore, is as follows: From Queensboro bridge over Thompson avenue, a shell road, and Jackson avenue as far as Broadway, Flushing, in very poor condition, being full of ruts and holes. From Flushing, through Little Neck, Manhasset, into Roslyn, the road is better. From Roslyn through Sea Cliff, Glen Cove, Bayville, Oyster Bay, Sciossett, the road is in very fine condition.

The best way from Oyster Bay to Cold Springs: Turn right on South street in Oyster Bay, following the new macadam road to irregular four corners—Sciossett—where you turn directly sharp left on a good dirt road, going

Editor's Note—At the present time scouts representing the Touring Club of America are engaged in studying road conditions in various parts of the country. Herewith are found reports made by them as to the condition of the highways in New York which undoubtedly will prove interesting to tourists who are taking advantage of fall weather.

by the fish commission; cross stone bridge, turn sharp left on new macadam into Main street, Huntington.

From Huntington to Greenport the road is in very fine condition, either by way of Center Port and Northport or via King's Park and Smithtown to Port Jefferson. The road that last year was very sandy from Port Jefferson east for considerable distance has been greatly improved and is now in very fine shape.

From Riverhead to Greenport through Mattituck is a very fine oil road.

From Greenport to Orient Point on the north the road is a fine oil macadam for 10 miles.

The main line across Shelter island is being macadamized and a detour is necessary, but it is thoroughly sign-posted and a fine oil road. From Sag Harbor to Easthampton the new state road is being built.

From Amagansett on the south shore through to Patchogue, the road is in very fine condition, with the exceptions of one or two spots that are a little rough, all being oiled road. A short-cut from Center Moriches is a good sandy and gravel road and saves considerable distance for those going from the south to the north shores.

The road from Sayville to Lake Ronkonkoma is in very good condition. From Greenport to Port Jefferson, direct through Mattituck, running into the main line at Wading river, is a fine wide gravel road; no towns that one has to slow up for, and on a quick trip is much the best route to take.

The ferry from Port Jefferson to New Haven has been discontinued for 1911.

The ferry from Port Jefferson to Bridgeport has gone on fall schedule and only makes one trip a day.

The ferry from Huntington to Stamford has not been running all summer.

The ferry from Rye to Sea Cliff maintains its schedule of a trip every other hour, leaving Rye on the even and Sea Cliff on the odd hours. The last trip of the day was discontinued September 11.

NEW YORK

The roads covered recently by the scout of the T. C. A., in official car No. 3, are mostly new routes and are going to be important in a few years.

From Nyack to Goshen the road is in very fine condition. From Goshen to New Paltz, via Walden, the road is very good. From Newburg to Walden there is considerable macadam.

From Walden to Ellenville, via Cragmoor, the road is good gravel and some macadam. The views on the route over the mountain are fine. Although the mountain is quite high, the ascent and descent are easy.

From Ellenville the trip over the mountain via Mountain Rest is fair to good. This is where cars have to be left if one desires to go to Lake Mohonk. The road up the mountain is steep and winding from Accord, and the descent into New Paltz is quite steep. The road is in good condition except for a few water bars.

From New Paltz to Highland, where connection is made for Poughkeepsie, the road is fine. New Paltz to Newburg via Walden is nearly all in good condition. Newburg to Liberty and Binghamton is a beautiful trip after leaving Monticello. The road follows the line of the N. Y., O. & W. R. R. and the river. There are no steep hills and no long ones, and while the road is narrow in places, there is no place where it is dangerous. Cars can easily pass at most any point. The road is good gravel nearly all the distance, with some stretches of macadam, and the entire trip can be made at any time. The road is all good, hard bottom, and in only a few places would one need chains even in wet weather. This route is to be macadamized all the way through. It is a short route to Binghamton, Syracuse, Rochester and Buffalo, being just 200 miles, New York to Binghamton via Middletown.

Connections have been made with this route from Ellenville to Liberty on a good gravel and macadam road and from Port Jervis on a good macadam and gravel road.

From Binghamton to Syracuse the route via Chenango Forks and then to Whitney Point through the Narrows, and then to Cortland and Syracuse—2 miles further than the present Blue Book route—is much better, so that the best time can be made over it.

The trip from Liberty to Binghamton is to be recommended to all who would enjoy a very picturesque and easy trip, with several good stopping places.

Rock, Austin, Buda, San Marcos, Goodwin, New Braunfels, San Antonio.

From San Antonio to Houston the most direct route is through Sequin, Luling, Flatonia, Columbus, Wallis Station, Houston. If you have the time and wish a longer route to Houston, covering a distance of about 110 miles, you might go by way of Victoria, which route is as follows: San Antonio, Sequin, Belmont, Gonzales, Cuero, Victoria, Telfner, Inez, Edna, Ganado, Wharton, Hungerford, Rosenberg, Richmond, Sugarland, Houston.

Leaving Houston on the homeward stretch go through Hockley, Waller, Hempstead, Hoke Station, Navasota, Melbourne, Bryar, Hearne, Hammond, Wooten Station, Kosse, Marlin, Waco. The balance of the route is the same as on the going trip.

HEADED FOR EL PASO, TEX.

Tulsa, Okla.—Editor Motor Age—Through the columns of Motor Age I would like some advice as to the most direct and convenient route between Oklahoma City, Okla., and El Paso, Texas. I intend leaving Tulsa on October 1 in my Hudson car.—R. D. Fuller.

The shortest route to El Paso, Tex., is as follows: Leaving Oklahoma use the Santa Fe railroad as a guide in motoring to Ardmore, Marietta, Gainsville, Tex., Denton,

Keller and Fort Worth. From Fort Worth to El Paso, Texas, motor through Ben Brook, Aledo, Annetta, Weatherford, Mineral Wells, Palo Pinto, Breckenridge, Amilene, Merkel, Trent, Sweetwater, Roscoe, Loraine, Colorado, Westbrook, Latan, Coahoma, Big Springs, Stanton, Odessa, Grand Falls, Fort Stockton, Marathon, Alpine, Marfa, Aragon, Valentine, Wendell, Chispa, Lobo, Dalberg, Torbert, Grayton, Sierra Blanca, Etholen, Lasca, Finley, Ft. Hancock, Fabens and El Paso.

TO BROWNSVILLE, TEXAS

Toledo, O.—Editor Motor Age—Will Motor Age outline a possible route from Toledo to Brownsville, Texas? Will it be possible to go clear through by motor?—Tourist.

A suggested route from Toledo to Indianapolis would be as follows: Motor to Lima through Perrysburg, Bowling Green, Bays, North Baltimore, Van Buren, Mortimer, Findlay, Bluffton, Beaver Dam and Lima; Lima to Indianapolis takes you through Snyder, Cridersville, Wapakoneta, Botkins, Anna, Sidney, Piqua, Troy, Eaglesburg, Vandalia, Englewood, Arlington, Lewisburgh, Gettysburg, Richmond, Centerville, Germantown, Cambridge City, Dublin, Lewisville, Dunreith, Ogden, Raysville, Knightstown, Greenfield and Indianapolis. Indianapolis to St. Louis, Mo., is the next stretch through Bridgeport,

Plainfield, Belleville, Stilesville. Mt. Meridian, Coatesville, Manhattan, Reelsville, Harmony, Brazil, Turner, Seeleysville, Terre Haute, Marshall, Martinsville, Casey, Greenup, Woodbury, Teutopolis, Effingham, Altamont, Bluffs City, Vandalia, Hagers-town, Mulberry, Greenfield, Pocahontas, Highland, Troy, Collinsville and St. Louis. St. Louis to Kansas City, Mo., takes you through Wellston, St. Charles, Cottleville, Wentzville, Forestell, Wright, Warrenton, Jonesburg, High Hill, New Florence, Montgomery, Wellsville, Martinsburg, Mexico, Thompson Station, Centralia, Sturgeon, Clark, Renick, Higbee, Yates, Armstrong, Glasgow, Slater, Marshall, Shackelford, Mt. Leonard, Blackburn, Corder, Higginsville, Mayview, Odessa, Oak Grove, Grain Valley, Blue Springs, Independence, Centropolis and Kansas City.

Kansas City, Mo., to Oklahoma City, Okla., is by way of Rosedale, Shawnee, Lenexa, Pleasant View, Olatha, Gardner, Edgerton, Wellsville, Ottawa, Waverly, Emporia, Plymouth, Cottonwood Falls, Elmdale, Clements, Florence, Peabody, Elbing, Wichita, Wellington, South Haven, Druey, Caldwell, Renfrow, Medford, Kremlin, Enid, Orlando, Mulhall, Guthrie, Edmond, Britton and Oklahoma City. The itinerary between Oklahoma City and Fort Worth, Tex., is Yukon, El Reno, Pocasset, Chickasha, Verden, Ana-

darko, Apache, Rohrer, Lawton, Walter, Temple, Hastings, Waurika, Ryan, Terral, Ringgold, Stoneburg, Bowie, Fruitland, Sunset, Alvord, Decatur, Herman, Rhome, Hicks, Saginaw and Fort Worth. From Fort Worth to San Antonio, Beelville and Corpus Christi you will pass through Crowley, Cleburne, Cuba, Grandview, Itaska, Hillsboro, Abbott, West, Waco, Lorena, Bruceville, Eddy, Troy, Temple, Little River, Sparks, Holland, Bartlett, Granger, Georgetown, Round Rock, Austin, San Marcos, Goodwin, New Braunfels, Selma, San Antonio, Floresville, Karnes City, Kenedy, Beeville, Skidmore, Papalote, Sinton, Callallen and Corpus Christi. The roads from Corpus Christi to Brownsville are fair.

We might outline another route for you by way of Chicago, Clinton, Ia., Omaha, Nebr., and Kansas City. The itinerary from Toledo to Chicago is through Caraghar, Swanton, Wauseon, Archbold, Bryan, Edgerton, Butler, Waterloo, Kendallville, Wawaka, Ligonier, Genton, Goshen, Mishawaka and South Bend, New Carlisle, Laporte, Westville, Valparaiso, Hobart, Highlands, Hammond, South Chicago, Bryn Mawr, Jackson Park and Chicago.

A route from Chicago to Omaha by way of Clinton, Ia., is recommended by the Chicago representative of the Official Automobile Blue Book Co. and is Garfield park, Oak Park, Maywood, Lombard, West Chicago, Geneva, Elburn, De Kalb, Creston, Rochelle, Ashton, Franklin Grove, Sterling, Emerson, Morrison, Fulton, Lyons, Clinton, Dewitt, Grand Mound, Wheatland, Lowden, Clarence, Stanwood, Mechanicsville, Lisbon, Mt. Vernon, Marion, Cedar Rapids, Belle Plaine, Chelsea, Tama, Montour, Butlerville, LeGrand, Marshalltown, State Center, Colo, Nevada, Ames, Boone, Beaver, Grand Junction, Jefferson, Scranton, Ralston, Glidden, Carroll, Arcadia, West Side, Vail, Denison, Arion,

Dow City, Dunlap, Woodbine, Logan, Missouri Valley, Reels Store, Crescent, Council Bluffs and Omaha. Between Omaha and Kansas City there are various roads to follow as illustrated in the September 14 issue. The balance of the route has been outlined above.

TOURING FROM DETROIT

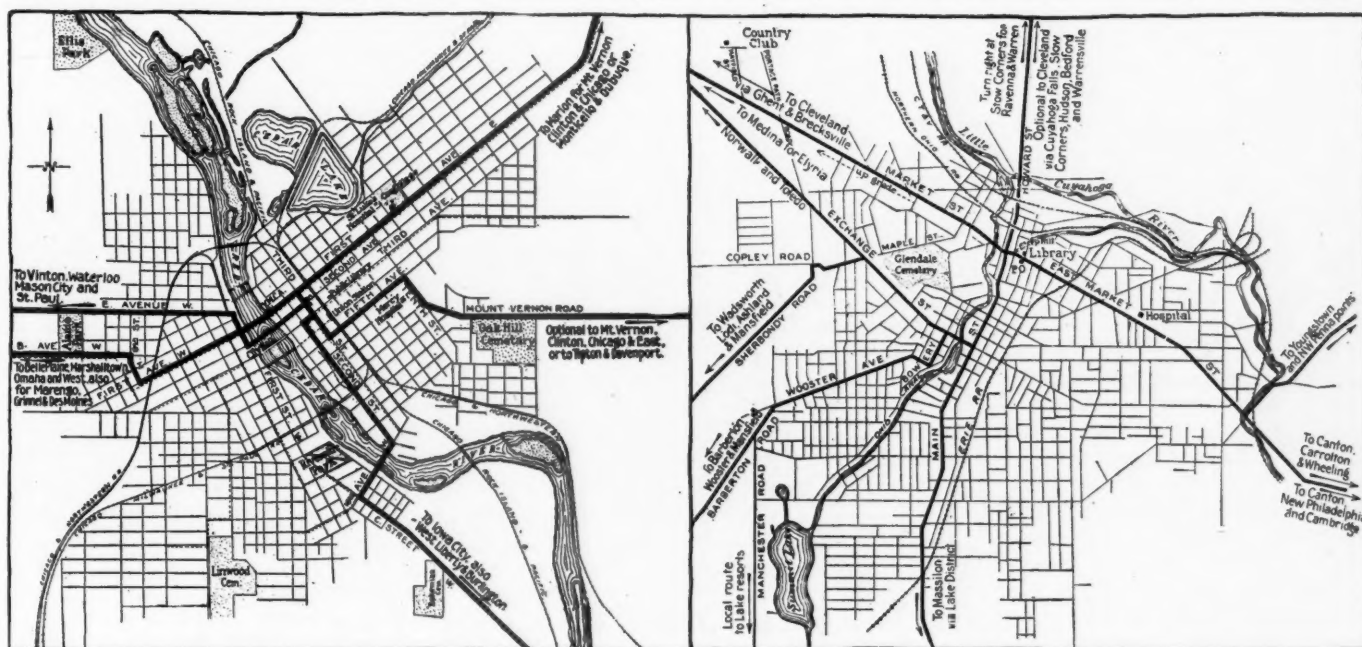
Charlevoix, Mich.—Editor Motor Age—Could Motor Age give me a nice week or 10-day trip from Detroit to Buffalo and back; also Buffalo to Cleveland, then to Cincinnati and Louisville; also a trip from Detroit to Toledo and Chicago, thence to Indianapolis and Louisville? My plan is to get my car at Detroit and take a little tour; then go south.—R. G. Morrow.

A suggested tour would be to leave Detroit and take the Canadian route to Buffalo, which is through a fine farming country; the roads, all told, are good. The Blue Book states caution should be used in passing horse-drawn vehicles. Although there are no large towns between Detroit and London, Canada, 141.7 miles, fair accommodations may be secured, but undoubtedly you will desire to make the run between these two cities in 1 day, the route being as follows: Detroit to Windsor, Canada, where you arrange for the Canadian customs; thence through Essex, Ruthven, Leamington, Blenheim, Ridgetown, Wardsville, Strathburn, Delaware, Lambeth, London.

On the second day continue to Hamilton, 79.9 miles, through a beautiful farming section, the towns being: London, Thamesford, Ingersoll, Woodstock, Brantford, Hamilton. Continuing to Niagara Falls, 50.5 miles, good roads all the way, go through Grimsby, Beamsville, Jordan, St. Catharines, St. Davids, Stamford, Niagara Falls. If you do not wish to remain on the Canadian side of the falls, cross the international bridge. Of course, on re-

entering the United States you should use special care in looking after the customs situation. After doing the falls it is but a short distance to Buffalo. There are many side trips out of Buffalo should you desire to spend a few days in that vicinity, while Buffalo itself offers many attractions in the way of fine boulevards and parks. With Cleveland your next objective point, which is a day's run of approximately 191 miles over excellent roads in dry weather, you motor through the following towns: Buffalo, Irving, Fredonia, Westfield, Northeast, Erie, West Springfield, Ashtabula, Saybrook, Madison, Painesville, Cleveland. Cleveland offers to the tourist attractions in the way of a side trip of 18 miles to Chagrin Falls; Brecksville is considered a beautiful trip because of its scenery; while a third beautiful journey in the fall, as well as during the summer months, is to Gates Mills and Willoughby. Cleveland to Cincinnati, 170.9 miles, is, according to the Blue Book, through level country and with excellent and macadam roads, going through Bellevue, Bucyrus, Marion, Delaware, Columbus. Columbus to Cincinnati, 121.5 miles, goes west over the national highway to Springfield, thence via Harshman, Dayton, the home of several motor car industries; Lebanon, Reading, Cincinnati. Cincinnati to Louisville, 88.2 miles, is via Lexington over a toll road to Lexington, going through Georgetown, Corinth, Williamstown, Crittenden, Covington, Ky., Cincinnati. The balance of the route, 78.4 miles, is over good pike through Frankfort, Peytona, Shelbyville, Louisville.

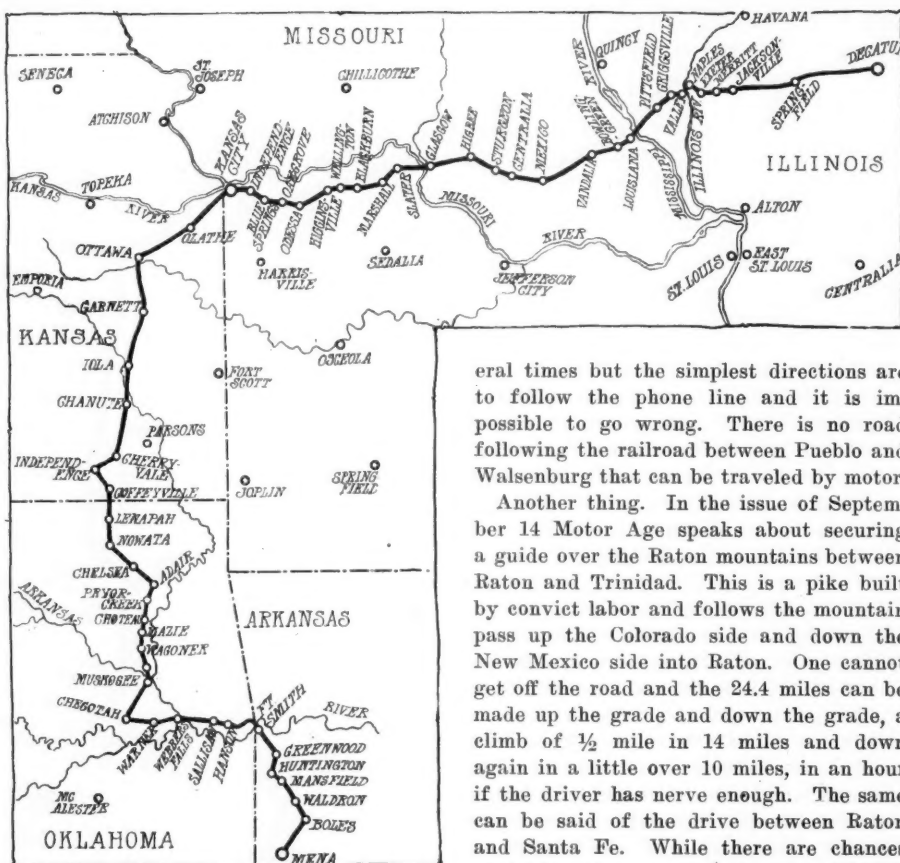
For the trip starting at Detroit via Toledo, Chicago and Indianapolis to Louisville, it is recommended that you follow the Blue Book routing, which is: Detroit to Toledo, 76.3 miles, through Wayne, Ypsilanti, Milan, Dundee, Toledo; Toledo to South Bend, 166 miles, via Caraghar,



MAP OF CEDAR RAPIDS, IOWA, SHOWING EXITS

MOTOR ROADS IN AKRON, OHIO, AND VICINITY

Prepared by Automobile Blue Book Publishing Co.



OUTLINE OF RETURN JOURNEY FROM DECATUR, ILL., TO MENA, ARK. THE GOING TRIP WAS MAPPED OUT IN THE ISSUE OF SEPTEMBER 14

Swanton, Delta, Wauseon, Bryan, Butler, Kendallville, Ligonier, Goshen, Osceola, Mishawaka, South Bend. South Bend to Chicago, 101.6 miles, by way of New Carlisle, La Porte, Westville, Valparaiso, Hobart, Highlands, Hammond, Chicago.

Chicago to Indianapolis, 204.8 miles, passes through Hammond, Crown Point, Thayer, Rensselaer, Remington, Wolcott, Montmorenci, LaFayette, Mulberry, Frankfort, Kirklin, Indianapolis. This is the shortest route between these two cities. Over good gravel and stone road most of the way the balance of the route, Indianapolis to Louisville, 123.4 miles, goes by way of Seymour, Uniontown, Cruthersville, Scottsburg, Vienna, Underwood, Henryville, Memphis, New Albany, Ind., and Louisville.

FOLLOW TELEPHONE LINE

Trinidad, Colo.—Editor Motor Age—We have several times noticed in Motor Age directions for tourists to reach Trinidad from Pueblo in motor cars, giving the names of the stations on the railroad. This is wrong. In leaving Pueblo motorists leave the railroad to their left, passing beside Minnequa lake and the big C. F. & L. reservoir, and then following the telephone line to Trinidad. The first town reached after leaving Pueblo is Walsenburg. The phone line is still followed out of Walsenburg, at which place the railroad is again touched. It is crossed and recrossed sev-

eral times but the simplest directions are to follow the phone line and it is impossible to go wrong. There is no road following the railroad between Pueblo and Walsenburg that can be traveled by motor.

Another thing. In the issue of September 14 Motor Age speaks about securing a guide over the Raton mountains between Raton and Trinidad. This is a pike built by convict labor and follows the mountain pass up the Colorado side and down the New Mexico side into Raton. One cannot get off the road and the 24.4 miles can be made up the grade and down the grade, a climb of $\frac{1}{2}$ mile in 14 miles and down again in a little over 10 miles, in an hour if the driver has nerve enough. The same can be said of the drive between Raton and Santa Fe. While there are chances of taking the wrong road, the telephone line instructions hold good and the way is easy. A portion of this road has been signboarded and the rest will be in a short time, giving distances and being as modern and as convenient and as little liability of being lost, in fact less, than there is in the state of Illinois.—John H. English.

HOMEWARD BOUND FROM DECATUR

Mena, Ark.—Editor Motor Age—We left Decatur, Ill., rather early on Monday morning, August 21, but it was after 10 o'clock before the final good-bye was said and we were fairly started; about a dozen miles out of town we had a rear tire blow out, tearing the inner tube into shreds; a new one was inserted and we were going again inside of 20 minutes. Near noon we came to Camp Butler, just east of Springfield. On getting out of Springfield we went through a large and very beautiful park with splendid drives, lakes and springs, and it looked so very inviting that we stayed there quite a while. The 40 miles from there to Jacksonville was made in little more than 1 hour, where we stayed that night and part of the next forenoon. From Jacksonville we went west through Merritt, Exeter, crossed the Illinois river at Naples, Valley, Griggsville, Pittsfield, where we met 22 motor cars from Hannibal, and then crossed the Mississippi river into Louisiana, Mo., and then through Bowling Green to Mexico, where we stayed that night. Corn, which is the main crop through this section, had been hurt badly by the dry weather. The roads from Jacksonville to Mexico by this route are good all the

way; the sandy roads are treated with a layer of straw, which works into the sand, making a good, hard road.

Our third day's run was to Marshall, Mo., by the way of Centralia, Sturgeon, Higbee, Glassgow, where we crossed the Missouri river and had more straw roads to Slater. The corn this day's run was not so good as the day before. At Glasgow we struck the official cross-state highway, which runs from Kansas City to St. Louis, and we followed it into Kansas City. It is the intention to make this highway a model road, and much work is being done on it this year. When within about 20 miles of Kansas City we struck freshly-oiled roads; in fact, we passed several motor oil tanks sprinkling the oil. These oil tanks have a rake attached to stir the oil into the dirt or gravel as it is distributed. This freshly-oiled road proved a nuisance to us, as the wheels of the car threw oil in all directions, and one could not get against the car without getting oil on the clothing. From Marshall we ran into Kansas City in about 4 hours' running time and did not leave Kansas City until the 26th.

Leaving Kansas City by way of Southwestern boulevard, we entered Kansas, the Sunflower state, going through Rosedale, Olathe, Ottawa and stopping that night at Iola, a very pretty town. Next morning we ran into Independence via Chanute and Cherryvale, where we visited some of the model dairy farms and an alfalfa ranch. Monday we left Kansas at Coffeyville and were on Oklahoma soil; then went through Nowata, Chelsea, and stopped at Pryor for the night. The greater part of this day we were in sight of dozens of oil pumps; there would be a little shanty with a gas engine in it, from which radiated linked iron rods to the pumps, and as the grass hid the rods from our sight it looked like those pumps were working just for the fun of it. Frequently these rods crossed the road, and we had to run over them. Every little shanty and farmhouse had a piece of gas pipe sticking up about 5 or 6 feet above the ground with a tin can punched full of holes on the top end, from which there was a blaze of fire. It must be a pretty novel sight at night on these flat, treeless prairies.

We ate dinner in Muskogee next day. Leaving Muskogee and going southwest, we passed hundreds of tall oil derricks, which extended down a valley as far as the eye could see; we went south and west as far as Chekotah, and then turned east to Warner, where we stayed all night. At Webbers Falls we began to encounter some of the worst roads we had yet found. We crossed the Arkansas river here, partly by water and partly by boat, the ferry boat landed on a gravel bar and lacked a whole lot of coming to shore; we had to run out into the river to get on and off. From there to Fort Smith it was just out of one mudhole into another, and we made small mileage that day. The road for the

most part just followed along on the railroad right-of-way, and I was tempted to get on the railroad and drive on the ties. From Fort Smith we came by way of Greenwood, Huntington, Mansfield, Waldron, Boles, Chant and Foran Gap. There were splendid roads nearly all the way to Waldron; Waldron to Chant they were fair, then it took us 5 hours to go 5 miles. The end of that 5 miles left us in a mud bank piled up in the middle of the road by enthusiastic road-builders a few hours before we got there. We stayed there that night, almost in sight of home, and next morning the water had run out of the mud so that by jacking up the car wheels and filling up the holes they left the dirt held the car up and we made good time right on through Foran Gap, getting into Mena in time for a late breakfast.

Since leaving Mena last July we have run over 1,700 miles, seen country that a traveler on the railroad does not see, and we have learned much of our own country, but never found a place we thought we would like as well as our own home country. We suited our own pleasure in taking stopovers and side trips; had varied experiences, some pleasant, some not so pleasant right at the moment, but taken as a whole it was a pleasure trip from beginning to end.

Expenses of the trip were but little more than living at home for the same length of time. We averaged 15 miles per gallon of gasoline, for which we paid all the way from 9½ to 30 cents per gallon; one gallon of engine oil ran us 160 miles. We drove leisurely so as to see the country as we passed through, and our best day's run was only 127 miles.—I. M. Davis.

TRAVELING SOUTH

Hammondsport, N. Y.—Editor Motor Age—Through the Routes and Touring Information department will Motor Age outline the best route from Hammondsport, N. Y., to Jacksonville, Fla.—C. P. Rudd.

You will find this a very interesting and picturesque trip, according to the Blue Book and various other authorities. It will take you to Watkins Glen, Elmira, Wilkes-Barre, Delaware Water Gap, Philadelphia, Washington, D. C., and on through the southern states. Headed for Wilkes-Barre you will pass through Wayne, Weston, Tyrona, Watkins, Montour Falls, Millport, Pine Valley, Horseheads, Eldridge Park, Elmira, Wellsburg, Lowman, Waverly, W. Sayre, Athens, Ulster, Towanda, Wysox, Standing Stone, Rummerfield, Wyalusing, Laceyville, Skinner's Ferry, Meshoppen, Russell Hill, Tunkhannock, Peterboro, Bowman Creek, Beaumont, Kunkle, Luzerne and Wilkes-Barre. For Philadelphia motor through Ashley Plains, Fairview, Glen Summit, Stoddardsville, Blakeslee, Pocono Summit, Swiftwater, Bartonsville, Stroudsburg, Delaware Water Gap, Portland, Mt. Bethel, Centerville, Richmond, Martins Creek, Easton, Bethlehem, Sieders-

ville, Friedensville, Center Valley, Coopersburg, Old Quakertown, Sellersville, Montgomeryville, Springhouse Philadelphia.

With Washington, D. C., your objective point, motor to Darby, Village Green, Chelsea, Concord, Wilmington, Elmsere, Marshalltown, Newark, Appleton, Fair Hill, Blueball, Calvert, Rising Sun, Battle Swamp, Perryville, Havre de Grace, Earlton, Churchville, Belair, Fork, Glen Arm, Lock Raven, Towson, Woodbrook, Baltimore, Catonsville, Relay, Laurel, Hyattsville, Blagdenburg, Stanton Square and Washington, D. C.

To Winchester, Va., you will motor through Ballston, Falls Church, Leesburg, Hamilton, Purcellville, Round Hill and Berryville, thence on the old national pike road the remainder of the distance to Jacksonville, Fla. From Winchester to Staunton there are numerous toll gates passing through Stephen City, Middletown, Strassburg, Maurertown, Woodstock, Edinburg, Mount Jackson, New Market, Lacy Springs, Harrisonburg, Mount Crawford, Burkstown and Staunton. Continuing to Roanoke go through Minto Springs, Greenville, Fairfield, Timber Ridge, Lexington, Fancy Hill, Natural Bridge, Buchanan, Troutville, Cloverdale and Roanoke.

Leaving Roanoke for Winston-Salem you will have to ford many small streams. The first part is very hilly and steep grades, while the last 25 miles is over rolling country. The towns are: Rocky Mount, Syndorville, Oak Level, Martinsville, Ridgeway, Stoneville, Madison, Ellisboro, Stokesboro, Kernersville, Centerville and Winston-Salem. Winston-Salem to Charlotte is over a rolling country through Midway,

Brinkleys, Lexington, Spencer, Salisbury, China Grove, Landis, Kanapolis, Concord, Newell and Charlotte. You will continue through Sloane's Ferry, Belmont, Lowell, Gastonia, Bessemer City, Kings Mountain, Grover, Blacksburg, Gafney, Converse, Spartanburg, Duncan, Greer, Greenville, Oak Grove, Piedmont, Anderson, Lavonia, Canon, Royston, Franklin, Commerce, Winder, Auburn, Lawrenceville, Snellville, Stone Mountain, Scottdale, Ingleside, Decatur and Atlanta. For Savannah and Jacksonville pass through Madison, Eatonton, Milledgeville, Sandersville, Louisville, Waynesboro, Millen, Statesboro, Blythe, Eden, Savannah, Riceboro, Eulonia, Darien, Brunswick, Brookman, Owens Ferry, Kinks Ferry, Dyall.

FROM NEBRASKA TO SOUTH DAKOTA

Grafton, Neb.—Editor Motor Age—Please give me the best route from York, Neb., through Atkinson, Neb., to Wessington Springs, S. D.—Joe Stahl.

From York follow the railroad to Aurora and Central City and thence go north to Fullerton, Albion, Petersburg, Elgin, Beligh and along the railroad to O'Neill and Atkinson. You will have to return to O'Neill and Neligh, thence travel north to Brunswick, Creighton, Verdigris to Running Water, where you cross into South Dakota. It is not advisable to cross any place west of Running Water, because that portion of South Dakota to Chamberlain has been settled only lately and roads away from the railroad are too uncertain to attempt. At Running Water motor to Loretta, Avon, Parkston, Mitchell, Letcher, Woonsocket and Wessington Springs.



KENOSHA, WIS., EXITS

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RACINE, WIS., AND ENVIRONS

CHICAGO—Editor Motor Age—The problem of proper gear ratio of a motor car is a big one, and I would like Motor Age to give a comprehensive analysis of it. I have read with interest of racing cars during the past summer that have used a ratio of $3\frac{1}{2}$ to 1 and attained speeds of practically 80 miles per hour. I was always under the impression that for racing purposes a ratio of $1\frac{1}{2}$ to 1 or 2 to 1 would be faster than a ratio of $3\frac{1}{2}$ to 1. Are there any methods by which the proper gear ratio for a particular car can be decided, and what are the leading factors in arriving at such a decision?—Reader.

The question of gear ratio is given little thought and it is safe to say it is but little understood in its various phases by the motor car users at large. Cars are bought with little thought of the conditions under which they are intended to be used. If a four-cylinder motor were properly geared to give a speed to the rear wheels in proportion to the ability of the motor to turn over, there would be little difference in the operation and handiness of four and six-cylinder cars of the same power.

It will be generally found that six-cylinder cars are as a rule geared lower than four-cylinder cars of the same piston displacement and thereby gain a reputation for smoothness at low car speeds to which they are not entitled.

If the six is geared in the same ratio as the four, then the six will be killed more easily by accident than the four. The four will make a final struggle and pounding, giving warning to the driver to release the clutch; but the six gives no warning—it simply dies.

This is not intended as an analysis of the two motors, but to bring out the

The Reader

DECIDING GEAR RATIOS

Motor Age Reader Thinks Local Conditions Should Determine Selection

important effects of gear ratio, so this element will be carefully looked into when the performance of any car is under consideration. The speed of a six-cylinder motor cannot be as great at maximum as a four, so that some allowance should be made for this also, in figuring desirable gear ratios.

The average car in use today is not pushed to 60 miles per hour even if it has the power to attain this speed. If the average owner assumes that 60 miles per hour is as fast as he ever will drive his car, then the gear ratio problem resolves itself into so gearing the car that, with the motor turning out its maximum speed the car will not exceed 60 miles per hour.

Upon inspection of chart 1 one finds a maximum speed line. This should not be taken as absolute; but as an approximation only. This line cuts through the maximum speeds estimated for motors of the indicated bore at which the motor will pull its greatest load on the block, but it is necessary to deduct about 25 per cent from this to allow for faulty carbureter action due to roughness of road surface, interference of air currents, etc., and in the following analysis this should be kept in mind.

The question of gear ratio may be computed from the accompanying charts given. An inspection of chart 1 will give the maximum speed of the motor; de-

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired

duct 25 per cent from this—for road allowance as described above, and enter chart 2 with this number of revolutions at the top, and the gear ratio will be found directly below and opposite the wheel size shown on the left margin.

Example: What gear ratio should be used on a four-cylinder motor, $4\frac{1}{2}$ -inch bore and 5-inch stroke, having 34-inch wheels?

Solution: On the curve—chart 1—for $4\frac{1}{2}$ -inch bore its maximum speed is shown to be 2300 revolutions per minute; 2300 less 25 per cent equals 1725 for the net revolutions per minute.

Now enter chart 2, and under 1725 and opposite 34 inches is the gear ratio or $3\frac{1}{2}$ to 1. The point falls half way between 3-to-1 and 4-to-1 line. This, then, is the proper gear ratio for the car with its maximum speed of 60 miles per hour.

If conditions are such that but 50 miles per hour is desired and all possible advantage at low car speeds, then the gear ratio will be one-sixth lower or 16.6 per cent, or four to one, which is not at all high in these days of high-speed motors. There are four-cylinder taxicabs, geared

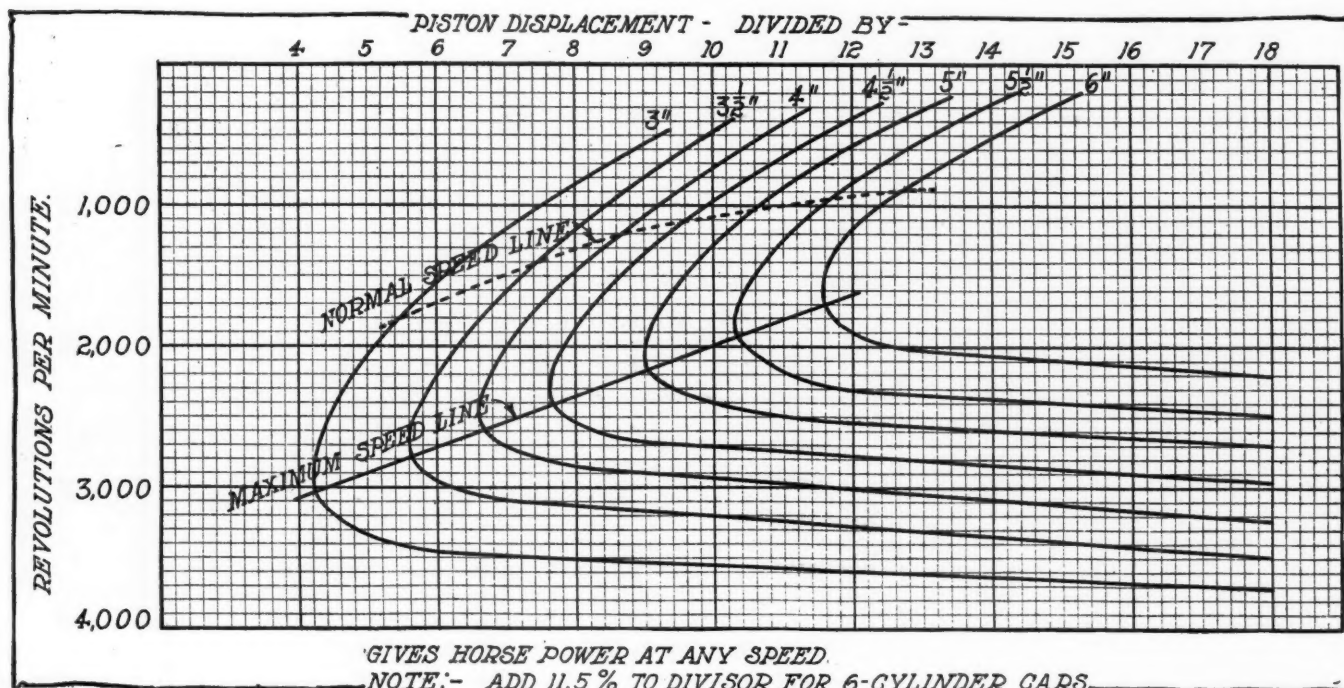


CHART 1—THIS CHART IN CONNECTION WITH CHART II ON THE FOLLOWING PAGE GIVES THE DESIRABLE GEAR RATIO FOR MOTORS OF DIFFERENT BORE OF FROM 3 TO 6 INCHES. THE MAXIMUM SPEED LINE IS THAT OF GREATEST EFFICIENCY

Clearing House

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated

5½-to-1, which will do 40 miles per hour with comparative ease.

There is difficulty encountered by the manufacturer when extremely high gear ratios are desired, but in England they are making successful experiments with worm-and-gear differentials and thus gain the desired ratio with the additional gain of quiet running.

A gasoline motor must turn over at high speed to obtain the best results. At low and moderate speeds too much time is allowed for the cooling of the gases of combustion during the power stroke, and hence a heavy loss of power is incurred. Many a racing car could be made speedier by means of a lower gear ratio, and many a car which is a poor hill-climber could be materially improved by lowering the gear ratio and at the same time obtain just as high speed on the level road.

As an example: Suppose you have a 5-inch motor which will do 60 miles per hour on a level road with roadster body, but does not perform well on hills on direct drive. We will assume that the car is geared two and a half to one. Chart 1 shows that this motor develops its full power at 2100 revolutions per minute. This, less 25 per cent, gives 1575 revolutions per minute. Chart 2 shows that at this motor speed the car can stand a gear ratio of just under three to one and still attain 60 miles per hour with 34-inch wheels; therefore it would be logical to reduce the gear ratio to three to one and thus obtain a better hill-climbing quality without losing any speed on level road.

It is easily shown that, if a car is geared too high, the motor cannot pull the car fast enough to attain the necessary motor speed to develop its full power, and this would be a very apparent case wherein the lower gear ratio would not only make a better hill-climber, but would show better speed performance on the level road also.

In looking into the gear ratio problem in this way, the writer is not dealing with racing cars in any sense. When 60 miles per hour is spoken of, it is meant for short spurts only, such as the private owner gives his car when he strikes a good stretch of road, and the low gear ratio recommended is not intended for long-distance racing at high speeds, for

ROADS SHOULD DECIDE Character of Country Important in Selecting Gear Ratio for the Car

such would probably overheat the standard motor, without additional oiling facilities. In fact, the racing rules take this into consideration and allow additional oiling pumps and pipes to directly supply the crankcase with oil from a reservoir. No engine of the gasoline type will stand prolonged high motor speed unless a considerable surplus of oil is used. The great heat and added friction will use up the stock oil supply on the cylinder walls in a short distance, and the stock lubricating devices—not being intended for racing—will not supply sufficient oil to the cylinders.

However, the oiling facilities will do for short spurts, as referred to, and the gear ratios recommended probably will be found to be satisfactory in most cases. The average purchaser of a motor car has no conception of the high speed at which his motor will turn over, and in fact, it is one of the wonders of modern motor car design that the motors will stand the terrific speed without damage. In going back to the Motor Age issue of January 6, 1910, one finds that the normal speed of a 4-inch motor is 2000 revolutions per minute, and that it will attain on the average a maximum of about 2500 revolutions. A few years ago this would have been considered impossible, and this very point should be considered in figuring gear ratio.

A car is used at under 30 miles per hour for at least 90 per cent of the time it is in service, and some consideration should be given to handiness and quickness during this 90 per cent rather than to high speed work during the other 10 per cent of the service. The handiness and smoothness will more than repay the owner for any lack of speed which the car may have when pushed to the maximum; but, as has been shown, there probably will be little loss of speed for short distances, and the better hill-climbing qualities and smoothness at low car speeds will more than balance any loss that there

might develop at the maximum speed.

The purchaser of a shaft-drive car is of course bound in limits to the gear ratio turned out by the manufacturers of that particular car; but often it is the practice for a manufacturer to make several gear ratio differentials and then the customer may find what he wants or something approximating it. The chain-drive machine may of course be geared to suit any taste; but even in the shaft-drive cars the gear ratio tendency will be found to be much lower than in cars of a few years ago, and this is no doubt due to the higher motor speed attainable today with the same safety and reliability as the much lower speeds of a few years ago. One firm which not more than 2 years ago never made a practice of gearing any of its cars lower than two and a half to one, whereas today its principal output is composed of cars geared three and one-half to one. These cars have lost nothing in speed and in fact have gained a little in this respect, and at the same time are infinitely more handy and smooth running than before.—F. H. T.

WRITES ABOUT GEAR RATIOS

Dubois, Pa.—Editor Motor Age—I agree with Mr. Sheridan and his article "Defending the High Gear Ratio" in Motor Age, issue September 7, but think that the size of the gears should be determined by the character of the country in which the car is expected to be used. In no case to be over 3½ to 1.

I have driven over a great deal of the eastern part of the United States with a seven-passenger car, weighing 4,200 pounds, with a four-speed transmission and, in very few places could I have gotten along with a ratio under 3½ to 1 on direct drive, direct drive being the fourth speed.

For seven-passenger and five-passenger cars with small engines and three-speed transmissions a ratio of 3½ to 1 is the

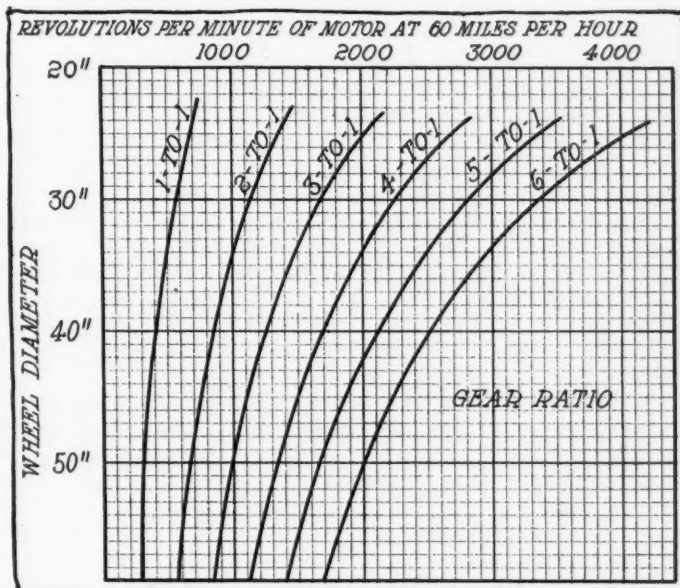


CHART II—THIS CHART IS USED, TOGETHER WITH CHART I, ON THE OPPOSITE PAGE, TO DETERMINE THE MOST ECONOMIC GEAR RATIOS WITH MOTORS OF DIFFERENT SIZES

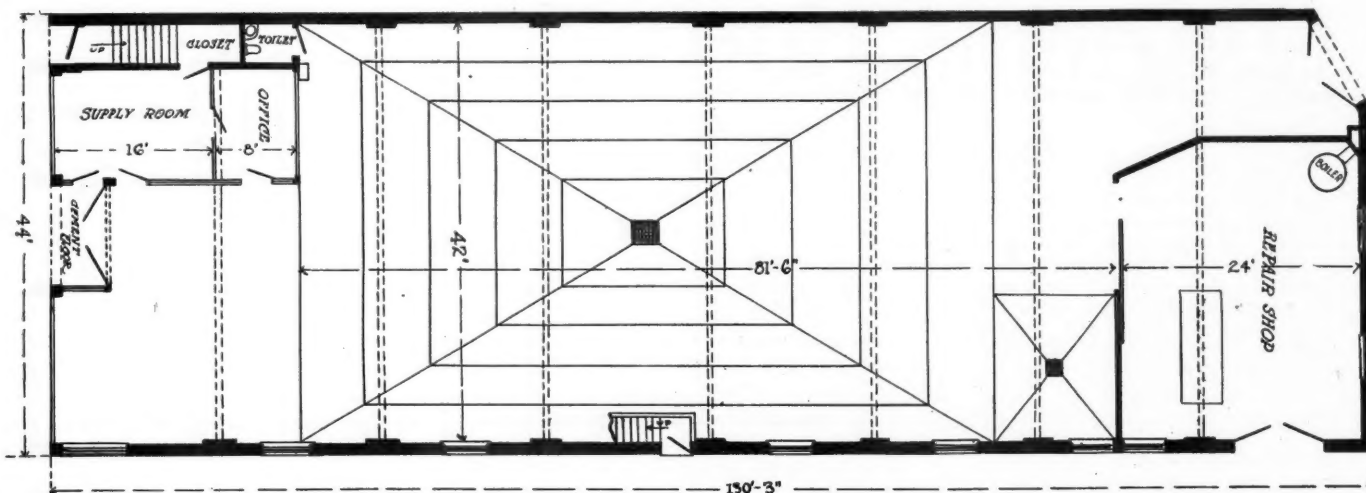


FIG. 1—FLOOR PLAN OF GARAGE SUITABLE FOR A SMALL CITY. THE SALESROOM, SUPPLY ROOMS, REPAIR DEPARTMENT, ETC., ARE ALL ON ONE FLOOR

best all-around working ratio, in other five-passenger cars $3\frac{1}{4}$ to 1 and roadsters 3 to 1. Higher than this would make it folly to ever attempt traveling in a hilly or mountainous country. A gear ratio of 4 or 5 to 1 is a detriment to the life and economy of a car. If such a ratio were a law, the object being to keep down speed, few who own cars now could afford the excessive motor deterioration and supply bills.

If more manufacturers would use the four-speed transmission with direct drive on fourth we would hear less grumbling of not sufficient power and a higher gear ratio could be given to the direct drive. I am sure the owners would find their cars very much more economical to run.—W. J. Marlin.

POWER OF AIR-COOLED MOTOR

St. Peter, Minn.—Editor Motor Age—I am designing an air-cooled, four-cylinder monobloc 3 13-16 by 6-inch motor with valves in a detachable head, so that the intake charge cools the exhaust valve. The valves are $2\frac{3}{4}$ inches in diameter, with $\frac{3}{8}$ -inch lift, and both intake and exhaust ports have a cross-sectional area of 2% square inches. I would like the following information:

1. What will be the horsepower of this motor at 1,000 revolutions per minute?

2. Would this engine be sufficiently cooled with 37½ square feet of cooling surface on the cylinders and heads; the air circulation effected by an exhaust fan drawing the air from a large sheet-iron jacket covering one side of the cylinders and heads?—Air-Cooled Crank.

1. While the S. A. E. formula, upon which motors are officially rated, gives only 17 horsepower for this motor, it should show 19 to 20 horsepower. The difference between the S. A. E. rating and the actual showing of this motor would be due to the extra long stroke, as compared with its bore, for the formula referred to does not take the stroke into consideration.

2. Just what the cooling surface of the cylinders should be will depend upon sev-

eral considerations that are not given in your data, such as the compression space, which determines the compression pressure and therefore the heat of combustion, and the size, design and speed of the fan. However, it would be safe to say that under ordinary conditions from 35 to 40 square feet should be sufficient.

AUXILIARY WATER TANK

Aurora, Ill.—Editor Motor Age—Illustrate in these columns a suitable type of auxiliary water tank which can be attached to a radiator for extra cooling.—Thermo-Syphon.

Motor Age illustrates in Fig. 2 a type of auxiliary water tank which has been used with entire success. Such tanks are generally made with an integral part of the radiator, and have been used at times where the radiator capacity has not been equal to all of the demands that the motor has to meet. There are not a few cases on record where tanks of this nature have been necessary in warm climates, where the excessive summer heat has more than taxed the capacity of the radiator. When adding a tank of this nature it is necessary to cut out a portion of the top radiator tank and fit the auxiliary tank close to this, so that there will be no opportunity for the pocketing of water in the tank.

COST OF MAGNETO UPKEEP

Bay City, Texas—Editor Motor Age—Replying to Mr. Carpenter's communication on the magneto situation, I wish to say that Mr. Carpenter seems to take my answer to his first letter very seriously and says he did not do the magneto any injustice whatever, but merely said, "Of course the magneto is satisfactory when it is right, but when it will not start the motor what are you going to do about it?"

Now, readers of Motor Age, please read Mr. Carpenter's letter in the July 27 issue and let us hear through these columns whether or not you think Mr. Carpenter did not rather hand the magneto a punch. Maybe not, but that was the way it looked to me. Now, what he said about the mag-

neto not starting the motor can be said equally as well about the battery. Mr. Carpenter goes on and gives us some figures as to the relative cost of the magneto versus the battery, both original and upkeep, wherein he places the cost of the magneto at \$150 with 10 per cent interest added per year, plus \$25 for upkeep, while he places the battery at \$30 with 10 per cent plus \$2.50 for recharging five times. He says this is on a basis of 5,000 miles for a season's run.

I think he sailed pretty high when he picked out about the highest-priced magneto on the market, and just a little above the average-priced battery and tried to compare them side by side. I think 1,000 miles per charge is the exceptional case, and not the average. Such was my experience before the magneto came into universal use, and I have not noticed any such great improvements in storage batteries the last three or four years, and I think I have kept up pretty well with such things as pertain to electricity in general.

For Mr. Carpenter's benefit, and others who may think the storage battery is still in the race with the magneto as far as the ignition question goes, I desire to give a little actual observation and not a bunch of statistical figures. Mr. Carpenter says \$25 for upkeep of the magneto for one year, the mileage being 5,000 miles. Now, in this part of the United States we figure 5,000 miles as no season's run at all, for the season lasts the year round, but that is neither here nor there in this case. I can today show Mr. Carpenter a car of which I had absolute care for one year—beginning January 15, 1910, and ending January 15, 1911—using a Remy magneto, which I think cost something less than \$150 by about \$100. This car was on the road practically every day of the year and during that year made something more than 18,000 miles. I have forgotten the exact figures, but during that time two sets of platinum points were used, costing \$4 per set. The magneto was inspected and cleaned four times which, at the usual garage price of \$1.50, makes a total of \$14 for 18,000

miles, and not \$25 for 5,000 miles, as per Mr. Carpenter's figures.

And that is only one case. Again, I can show a car using a Splitdorf magneto which did not cost \$150, on which the clamp strap was not even loosened until after the speedometer had registered 8,500 miles, and I can also show the bills for this same magneto, which is still in service after furnishing current for over 25,000 miles; these bills only amount to \$13.40.

If Mr. Carpenter will just keep on with his figures he will find that at the end of 25,000 miles his storage battery will have cost him almost as much as this magneto, besides the bother of having to wait for recharge, or else the additional cost of either another storage battery or a new set of dry cells every other charge practically, and in what condition will said storage battery be after 25,000 miles? Of course, Mr. Carpenter will say, "Yes, but you had to have a set of dry cells to start your motor even with the magneto." Yes, at a cost of \$1 per set per 3,000 to 4,000 miles if handled judiciously, and who would not pay that for two means of ignition when on the road? But then magnetos are being built today that do not require dry cells for starting and are giving good satisfaction. I can show Mr. Carpenter one of these listed as low as \$20, guaranteed to start the motor without the aid of the battery.

Again, he says he is glad Mr. Van Patten came over on his side of the fence and that Mr. Van Patten's scientific arraignment of volt and ammeter clinches the battery fact beyond refutation. Such being the case I suppose we will now see our foremost gas motor engineers discarding the magneto and installing said arrangement on their makes of cars.

As to the remagnetizing the magnets of a magneto. I do not say that it does not have to be done sometimes, but I think most garage men, and those who know, will agree with me when I say that such cases are exceptional or rather more than exceptional. And these exceptional cases will compare pretty well, I guess with those times when the storage battery has been overcharged and when some irre-

sponsible person has turned the switch on the battery and gone away and left it so, thus killing the battery.—James P. Cherry.

CARPENTER MAKES RETORT

Sauk Centre, Minn., Sept. 21.—Editor Motor Age: I have read these communications in Motor Age, one from A. H. D. Altree, Chicago; one from J. A. Goodechild, Pontiac, Mich.; one from J. B. A. Benoit, Benson, Minn., in which all criticised the reference to the battery and magneto discussion. Mr. Altree says he sells magnetos at "very little excess" price over the one-third of the \$150 I named as a fair price for a good magneto. Now we do not care what the discount is on these magnetos, but we find listed in a reliable Chicago house catalog magnetos at \$7.50 to \$35. I also find Bosch listed at \$36 to \$135; Simms, \$34 to \$133; Splitdorf, \$50 to \$150; Eisemann, \$60 to \$170 and so on. I was not far out of the way when I said about \$150. I did not specialize any form of magneto, but said a good magneto.

Mr. J. B. A. Benoit's article on page 28, Sept. 14, proves, without explanation, the statement relative to the re-charging of the magnets, and says he has found "three magnetos in 3 years that had to be remagnetized," and he is only one of the many men in the U. S. where so many magnetos are made and sold,—how many would he have found if he had kept on.

My volt and ammeter reading on my car yesterday was $5\frac{1}{4}$ volts, 36 amperes, and my speedometer reading 631 miles since the storage battery was recharged, giving a mileage far in excess of that stated by me in Motor Age. To be clear, I have traveled 631 miles on 24 ampere-hours giving me still 369 miles to complete the 1,000 and 36 amperes and $5\frac{1}{4}$ volts with which to complete it. My car is a high-powered roadster, $22\frac{1}{2}$ horse power, weight 1,350 pounds, and has carried one to three passengers.—A. D. Carpenter.

GARAGE EQUIPMENT

Sunnyside, Wash.—Editor Motor Age—We are contemplating building a new garage, 50 by 132 feet, and I would like some information concerning the construction of same, such as floor plan and shop dimensions, location of benches, location of machinery; also the machinery and equipment for a well-equipped garage, more particularly the location of the various vises, drills, etc., so that the equipment will be placed to the best advantage and be a time saver. Will Motor Age publish a floor plan, etc., showing such arrangement?—Smith.

The equipment for a small garage, fitted for all kinds of ordinary repairs, would consist of a washrack with overhead water connections; an underground gasoline tank, from which the gasoline can be pumped when needed; and several lubricating oil tanks with pumps, so that several grades of oil can be carried in stock. Some office fixtures and a couple of show cases might also be necessary.

The machine shop should contain a lathe, a drill press, an arbor press, an emery grinder, a forge, an air compressor and storage tank with piping for distribution about the shop and garage; about a 3-horsepower electric motor to operate these machines; work benches with vises; and perhaps a tire vulcanizing outfit. The machine tools and shop equipment should be arranged according to the amount of use to which they are to be put. In a floor plan such as is shown in Fig. 1 the benches should be arranged along the wall, having windows in it, and the vises should be secured to the benches to the left of the windows. The lathe and drill press may be placed near the partition, as they are not used continually and should be both accessible and out of the way. The forge might occupy the corner indicated by the boiler's position, and the air compressor and emery-wheel grinder would be near the machine tools. There is a good description and floor plan of a garage on page 30 of the June 1 issue of Motor Age, which might suit you better than that given herewith which is for a building 44 by 130 feet in size.

FRONT-WHEEL DRIVE

Elgin, Ill.—Editor Motor Age—Will Motor Age illustrate a convenient method of mounting an electric motor as a unit with a truck wheel for four-wheel drive?—Commercial.

In Fig. 3 is illustrated how an electric motor can be mounted above the steering knuckle of a front wheel for four-wheel drive. The motor is carried on the vertical spindle passing through the yoke of the axle. As illustrated, a double gear reduction is made use of, the small pinion on the armature shaft meshing with the gear on a countershaft, which countershaft in turn has a pinion driving into the larger gear on the road wheel. Provision could be made for entirely enclosing the gearing, if necessary.

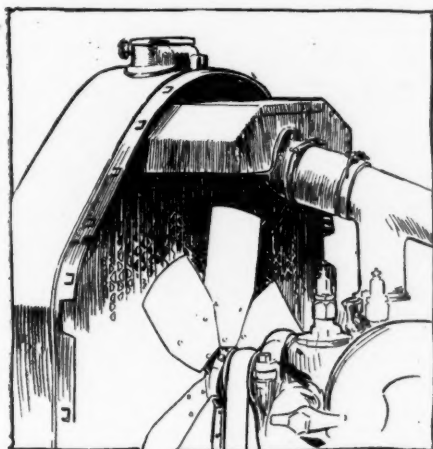


FIG. 2—AUXILIARY WATERTANK FOR RADIATOR

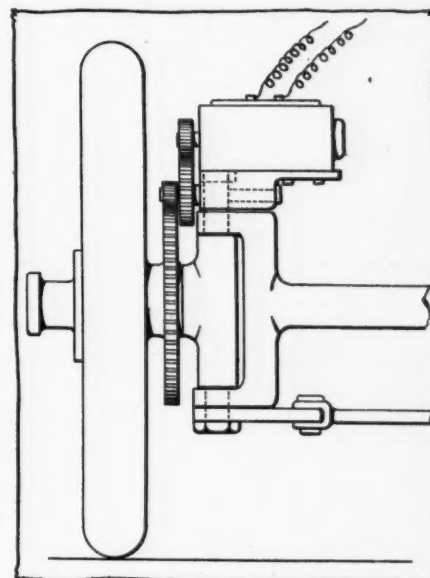


FIG. 3—DIAGRAMMATIC METHOD OF MOUNTING A MOTOR

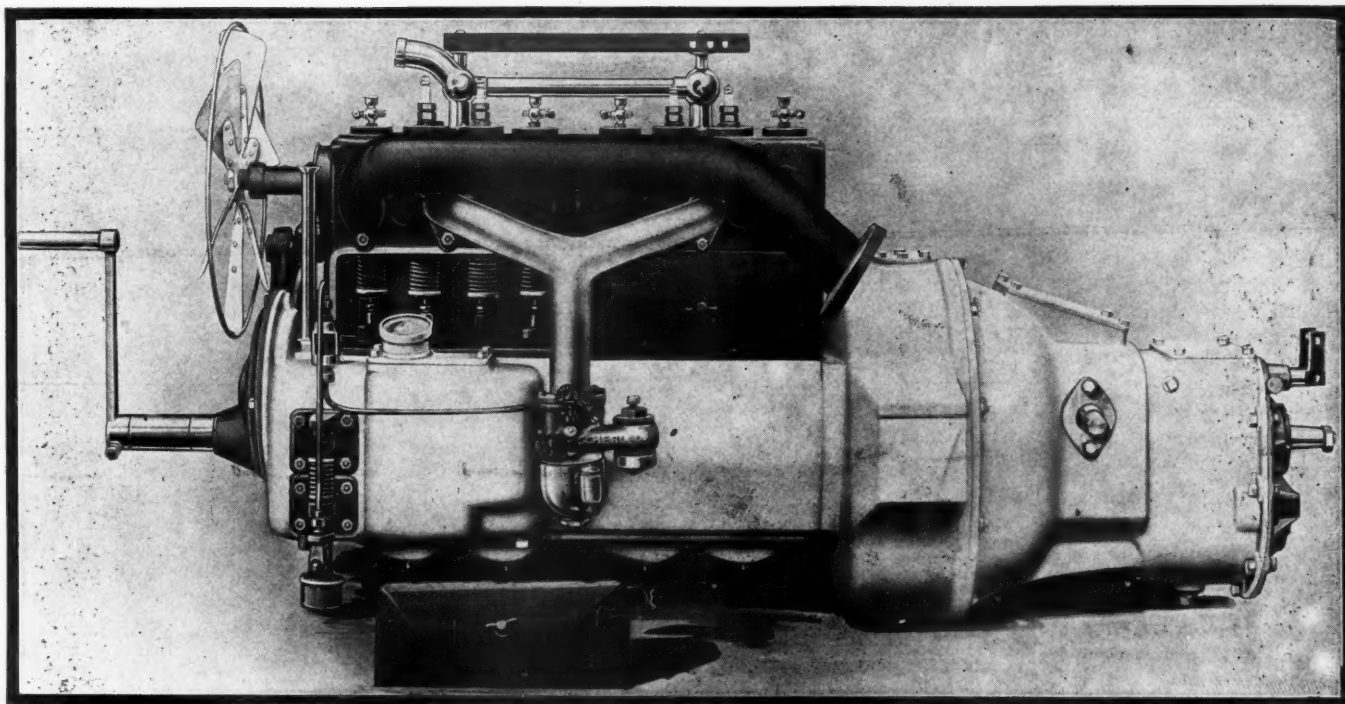


FIG. 1—UNIT POWER PLANT OF COLE 30-40 FOR NEXT YEAR SHOWING HALF OF VALVE SPRING COVER REMOVED

Cole 30-40 for 1912 Makes Its Debut

New Lubricating System Chief Feature of Next Season's Product—Wheelbase Increased to 122 Inches—Other Minor Changes in Chassis to Which Are Fitted Seven Body Types

AS the Cole 30 has been shown in factory tests to deliver more nearly 40 horsepower than 30 horsepower, the 1912 line will be known as the Cole 30-40, although the S. A. E. formula rates the motor at 32.6 horsepower. The Cole series for 1912 offers seven different types of bodies, all of which are fitted to one standard chassis.

The important mechanical changes from the 1911 construction include the increase of wheelbase from 118 to 122 inches, an improved system of lubrication, increase in the size of tires from 34 by 4 inches to 36 by 4 inches, and the use of a V-shaped torsion arm instead of the torsion tube. Some of the other refinements are the tell-tale sight oil feed on the dash and the gasoline gauge which has been fitted to the fuel tank. Another change is the use of Timken floating axle with Timken roller bearings.

The unit-type power plant in connection with a three-point suspension is employed in the Cole 30-40 construction. The three vital parts, the motor, the clutch and the transmission are combined in one unit, encased and suspended upon a three-point support so that it cannot easily get out of line, making for efficiency in power transmission and lessening the disalignment strains on the mechanism. The three-point support is perfected by the single front support being a trunnion which automatically swivels so that no twisting strains

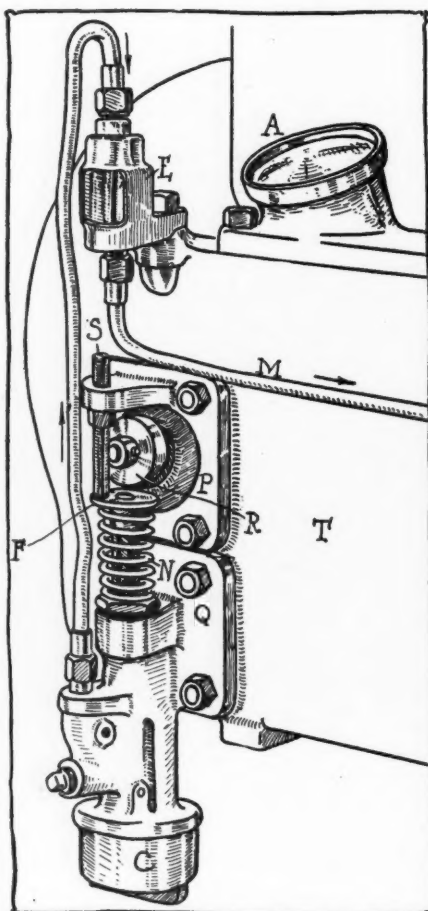


FIG. 2—OIL PUMP AND GAUGE

can be transmitted to the power plant, and so that the latter will be in alignment with the propeller shaft.

The Motor Is Square

The motor has four-cylinders with $4\frac{1}{2}$ -inch bore and $4\frac{1}{2}$ -inch stroke. The cylinders are of the L type, cast in pairs and with the waterjackets integral. Both the intake and exhaust valves are on the left side. The effective diameter of the valves is 2.332 inches. The lift rods and springs are inclosed by easily removable plates, which are shown in the view of the motor in Fig. 1. Patented valve guides prevent oil from escaping from the valve rods. The motor is tipped $2\frac{1}{2}$ degrees with respect to the horizontal to give a direct straight-line drive.

The connecting rods are drop forged steel and the crankshaft, which is a drop forging from a nickel-carbon steel, undergoes a special heat-treating process to toughen it. All three of the crankshaft bearings are of unusually large surface and are made of die-cast babbitt. The crankshaft is offset, removing the tendency to the motor stopping on a dead center. The camshaft is a drop forging with integral cams hardened and ground, and three phosphor-bronze bearings afford positive rigidity.

The magneto, water pump and fan pulley are all on one shaft, which runs on a double row of imported ball bearings. The timing gears are helical cut so that three

teeth always are in mesh. This makes for silent operation of the gears, which is further assured by an easily removable cover plate.

Cooling is obtained by means of a positive water circulation maintained by a rotary water pump and assisted by a ball-bearing steel fan. Adjustment is provided for taking up the stretch in the fan belt. The ignition is of the Bosch dual type, comprising a Bosch high-tension magneto and a set of dry cells. The magneto is gear-driven and is located on the opposite side of the motor from the carbureter. The high-tension wires are held in the carrier made of specially treated wood. A kick switch is provided on the dashboard instead of the old-style wooden coil box. A Schebler carbureter is used with a Y-shaped intake manifold.

New Lubricating System

The new motor lubricating system of the 1912 Cole models deserves careful consideration. The system cannot be relegated to any particular class, as it is unique in several ways. In operation it partakes very much of the constant-level splash system. It possesses a decided advantage over the latter in that fresh oil is constantly added instead of the dead oil being used over again. Constantly adding fresh oil to the lubrication system is becoming the practice in Europe. The Mercedes, for one, has adopted it and Rolls-Royce has employed it for some time. This system consists of two distinct parts—the fresh oil supply system and the constant circulation system.

Referring to Fig. 2, it is noted that oil is put into the oil reservoir cast upon the forward end of the crank case through the

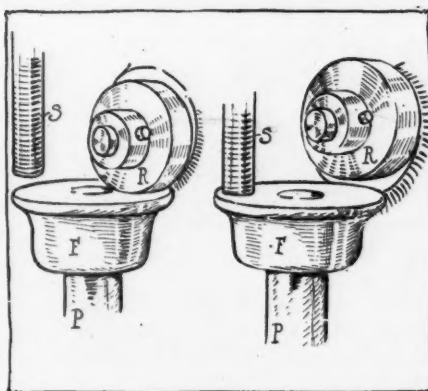


FIG. 3—OIL FEED ADJUSTMENT

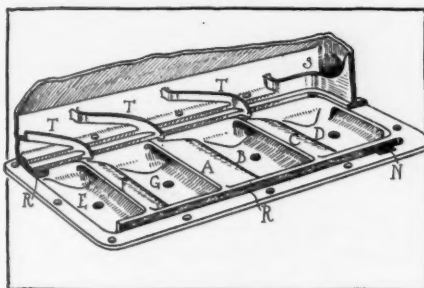


FIG. 4—BOTTOM OF CRANKCASE OF COLE 30-40.

filler opening, A. From the oil reservoir the oil travels through the pump. This is shown in section in Fig. 8, the plate Q, supporting the pump, bolts onto the side of the oil tank. At the same time it closes an aperture in the side of the tank through which oil is drawn into the oil pump. The path of the oil is from the opening B down the passage I into the setting cup C. From here it is removed

by the pump P. On the up-stroke of the plunger P the oil is drawn through the admission valve V. On the down-stroke the oil is forced past the check valve D and up the feed pipe to the sight feed. Little pins K and H are placed above the ball valves to keep them in place. At the upper end of the plunger cylinder there is a stuffing box G, the packing in which is indicated at O. As the nut G, by which the stuffing box is kept tight, is accessibly located, there is no excuse for oil leakage at this point.

Returning to Fig. 2 it will be seen that the oil in leaving the pump travels upward, as the arrows indicate, through the vertical feed pipe and into the top of the sight feed E. This sight feed is located on the forward left-hand side of the crankcase. As it is well above the side frame members, it can readily be observed when adjusting the supply of oil. From the sight feed the oil passes out in the direction M to the crankcase. It is interesting to note that the oil is not directly led into the crank case, but to the middle camshaft bearing. The oil is led into the middle of the bearing in a horizontal direction. As the camshaft journal is spirally grooved, it tends to carry oil out at either end and thus discharge it into the crankcase. Thus the entire new oil supply on its way to the crankcase lubricates the middle camshaft bearing.

Obviously, this fresh oil supply provides new oil to take the place of that used up in the course of lubrication. For city use an engine seldom has to work very hard and so does not use up a large amount of oil. On the other hand, for high-speed work, or where the going is so severe that

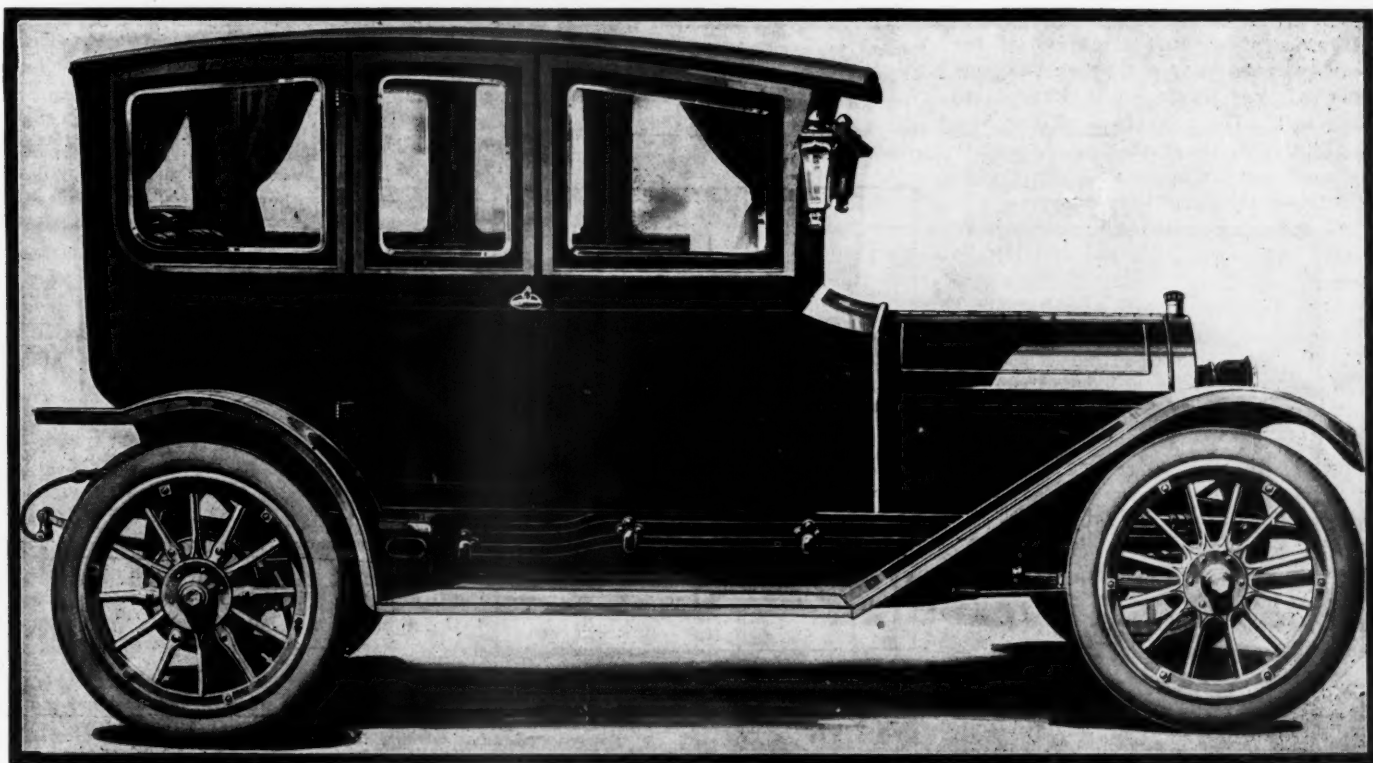


FIG. 5—COLE 30-40 LONDON LIMOUSINE BODY

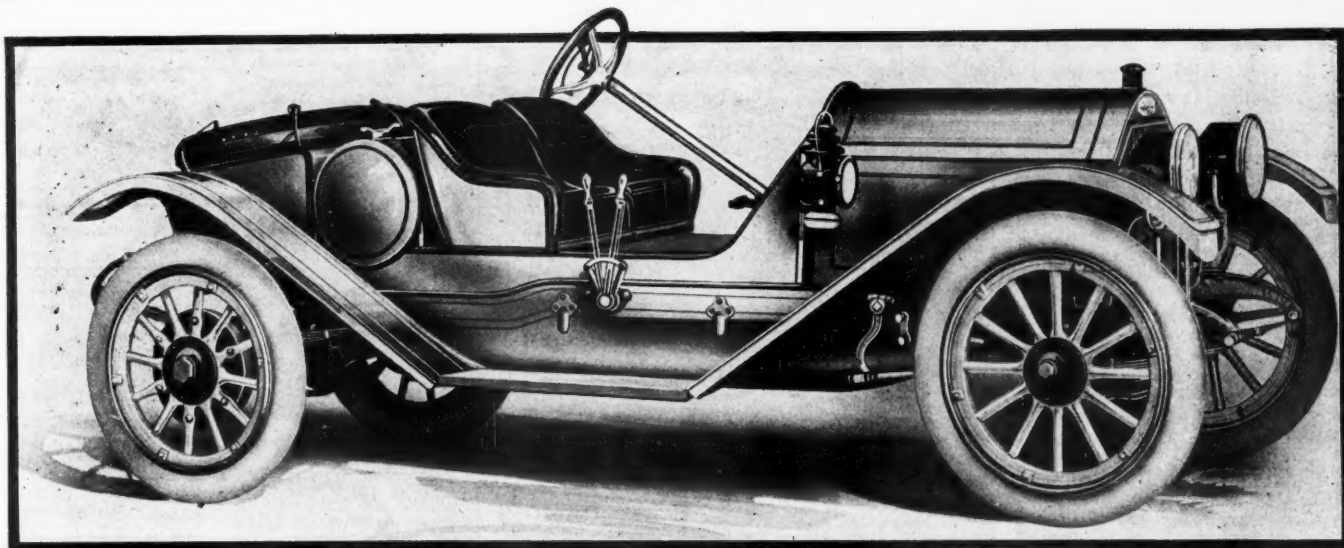


FIG. 6—SPEEDSTER BODY OF THE COLE 30-40

the lower speed has to be used and the engine speeded up, more oil will be required. To permit adjustment for every condition a simple device is used.

Oil Feed Adjustment

This will be explained by means of Figs. 2 and 3. In each the letters are consistently applied. Plate P has an extension inward which carries the pump driveshaft. The hole in the oil tank through which this passes has no communication with the interior of the reservoir. Therefore, if P should be removed, no oil would escape from the reservoir, as would happen if Q were detached. On the inner end of the pump driveshaft is carried a small worm wheel. This meshes with a worm on the camshaft. By using the worm a reduction of 25 to 1 is obtained—that is, the camshaft turns twenty-five times to one turn of the pump driveshaft. As the camshaft runs at one-half the speed of the crankshaft, the pump shaft therefore must make only one revolution to fifty of the crankshaft. The advantage of this system resides in the fact that the engine never can reach a speed at which the inertia causes the pump to be inoperative.

The following method is employed to operate the pump: On the end of the pump driveshaft is a small pin set eccentrically. For this reason it works like a little crank. Upon this pin is mounted the roller R. In Fig 3 this roller is shown when the crank is in the lowermost position—that at the left—and in the uppermost position—at the right. The roller contacts with the mushroom follower F, which is fixed at the top of the pump plunger P. In the left-hand view the plunger is indicated as fully depressed against the resistance of the spring N, all the oil under the plunger having been forced into the discharge pipe to the sight feed. As the pump driveshaft rotates the roller approaches the position shown at the right. Before R gets to the upper position, the follower F encounters the stop S, and the pump ceases to draw in oil. When the roller next reaches the follower

it is traveling downward, and hence P is forced downward and the oil just drawn in is forced out. From this it will be seen that the supply of oil delivered each stroke depends upon the quantity of oil drawn into the pump on its upstroke before it strikes the top, S. When the pump is in the lowermost position, the left-hand figure, the clearance between F and S is equal to the stroke of the pump. The greater the clearance, the greater will be the quantity of oil delivered each time. Conversely, the less the clearance the smaller the volume of oil pumped will be. This constitutes the fresh-oil supply system.

The Circulation System

Now let us consider the circulation system inside the motor. In Fig. 4 the bottom of the crankcase is shown. This is the oil or splash pan. For the sake of explanation, one of the side walls of the crankcase is sketched in its relative position to the splash pan. It is duplicated on the near side. The makeup oil runs down on to the plate A, and thus enters

the circulating system. When the system is in operation there is oil in each of the basins, E, G, B, and D. They are separated from each other by the partitions, F, A and C. Into each of these basins a connecting rod dips. It splashes some of the oil contained in the basin upon the side walls. This oil runs down and is caught in the troughs T and conducted to the next forward basin. When it reaches the foremost one D, it cannot go any further in that direction, so a return duct has to be provided. This duct carries the oil from the trough S, at the side of the front basin D, back to the rear basin E. On the near side of the splash basin this duct is shown at R, the oil reaching it through the opening N, which communicates with a trough similar to S, but upon the near crankcase wall. On the far side the point at which the oil comes into the rear chamber E, can be seen at R. The peculiar shape of the splash basins is due to the desire to prevent the oil from running forward, except by means of the troughs T when the car is descending a hill. This prevents flooding the front cylinder. On the other hand, if the forward basins spill over the rearward ones when ascending a hill, the character of the circulating system will quickly correct it. Therefore, with this system each cylinder receives the same amount of lubrication, whether ascending or descending a hill. Also the oil supply is constantly being renewed and not using a large quantity of old, dead oil over and over again.

Fig. 7 illustrates the connecting rod big end, the lower cap of which is provided with a tubular scoop C, which dips into the oil on every stroke. Oil is carried up into the bearing and distributed by means of the grooves G cut upon its surface. The upper half has a hole H cut in it for the same purpose and identical oil grooves. The halves of the bearing are held together by means of two large bolts. A number of shims are placed between the halves. These are graduated in thickness so that adjustment of the bearing can be

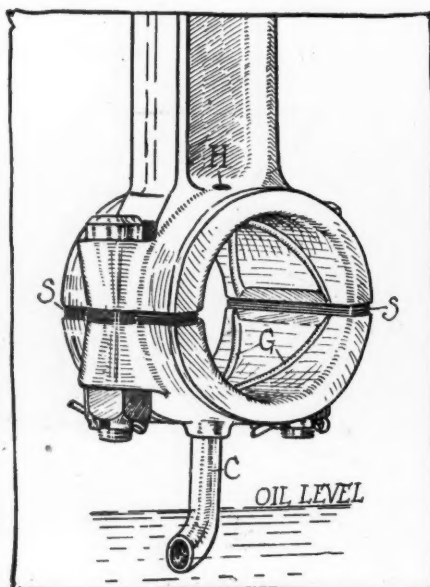


FIG. 7—END OF COLE CONNECTING ROD

readily made. The main bearings, three in number, have large oil pockets cast above them, into which the oil is splashed.

Leaving the motor it is found that the rest of the power plant is conventional. **Clutch of Cone Type**

The clutch is of the cone type with $2\frac{1}{4}$ -inch leather face. Under the leather are six flat steel springs to permit gradual engagement of the clutch. The cone is of aluminum, which makes it very light and reduces the spinning effect due to its momentum when disengaged to shift the gears. The outside diameter of the clutch is 18 inches. Large cover plates on the aluminum housing permit easy access for examination and for adjustment of the clutch spring.

The gearset is a part of the unit power plant and is encased in an aluminum housing with a large cover plate. It is of the selective sliding gear type and affords three forward speeds with direct drive on the high gear. Imported annular bearings are used throughout the gearset. The gears are of chrome nickel steel, oil-tempered and ground, and are carried on very short shafts. The control levers are placed at the driver's right, inside the body on the five-passenger touring car, but are located outside on the toy tonneau and roadster.

The transmission of power from the gearset to the rear axle is by means of a nickel steel propeller shaft. The tipping of the motor gives a direct line drive so that only one universal joint is necessary between the motor and the rear axle. The torque is taken up by means of a V-shaped torsion rod, a change from last year's construction, in which a torsion tube was employed. The rear axle is of the floating type, Timken construction with Timken roller bearings throughout.

The front axle is a single piece I-beam forging with drop-forged steering knuckles and spring perches. The steering knuckles ride on end-thrust ball bearings and extra large ball bearings are fitted to the front wheels. The steering mechanism is of the worm-and-gear type, with a 17-inch hand

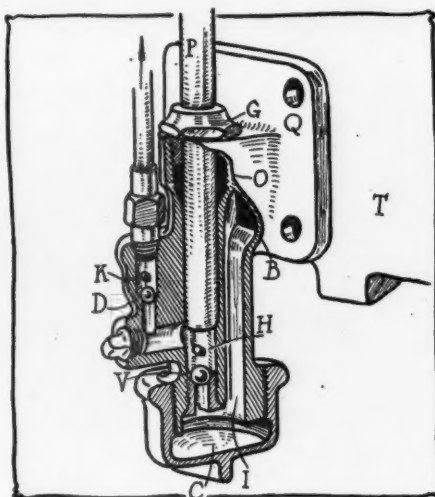


FIG. 8—DETAIL OF OIL PUMP OF COLE 30-40 MOTOR

wheel. The steering gear has end-thrust ball bearings to assure ease in guiding the car. The frame is of channel steel of double drop construction. The $2\frac{1}{2}$ -inch drop gives the car a low, rakish appearance. The only change in the frame this year is in the increased length necessary to give the chassis the 122-inch wheel base.

The Braking System

Two sets of brakes are provided, operating on the rear wheel drums, which are $12\frac{1}{2}$ inches in diameter and $2\frac{1}{4}$ inches wide. The service brakes of the external contracting band type are thrown into play by means of a pedal, while the expanding emergency brakes are controlled by hand lever. The brake bands are lined with asbestos and the brake rods are carried entirely inside the frame, affording them protection and giving cleaner lines to the cars.

The standard body types for the 1912 Cole include a five-passenger touring car, toy tonneau, roadster, speedster, coupe, limousine, and London limousine. A noticeable change in appearance in the closed bodies is caused by the adoption of the Queen Ann styles of body panels and doors. All the metal parts on the body are either

nickel plated or black enamel, doing away with all polished brass surfaces. A feature in the line of equipment for this year is the fitting of all oil lamps with sockets for electric lamps, so that electric lighting can easily be adopted.

MOTOR CAR LITERATURE

"A Test of Trucks" is the title of a booklet, issued by the Federal Motor Truck Co., Detroit, Mich. It is an echo of the recent Chicago-Detroit commercial run, and incidentally brings out the merits of the Federal truck as demonstrated in the run.

The Henderson Bulletin is issued by the Cole Motor Car Co., Indianapolis, Ind., for the benefit of its sales agents, in order to keep them in close touch with the doings of the Cole cars throughout the country.

Condensed Catalog No. 160 from the Bristol Co., Waterbury, Conn., describes and features the line of Bristol recording instruments for pressure, temperature and electricity, as well as the thermometer-thermostat and indicating pyrometer.

The Automobile Mfg. and Engineering Co., Detroit, Mich., has issued a conventional catalog featuring its line of Evans motors. In addition to the motor, specifications of the Evans Limited commercial car are given.

The New Departure Mfg. Co. of Bristol, Conn., is sending out to members of the S. A. E., and others who ask for it, a neatly printed set of twelve data sheets ready for insertion in the S. A. E. Hand Book. These sheets cover descriptions of all New Departure ball bearings, in the double row, single row, magneto and new cup and cone types, also accurately compiled tables showing standard press fit and push fit on shaft and in casing, and diagrammatic tables compiled by Frederick Hughes, the company's chief engineer, by which the maximum thrust and radial load capacity of any bearing running at any speed can be easily determined.

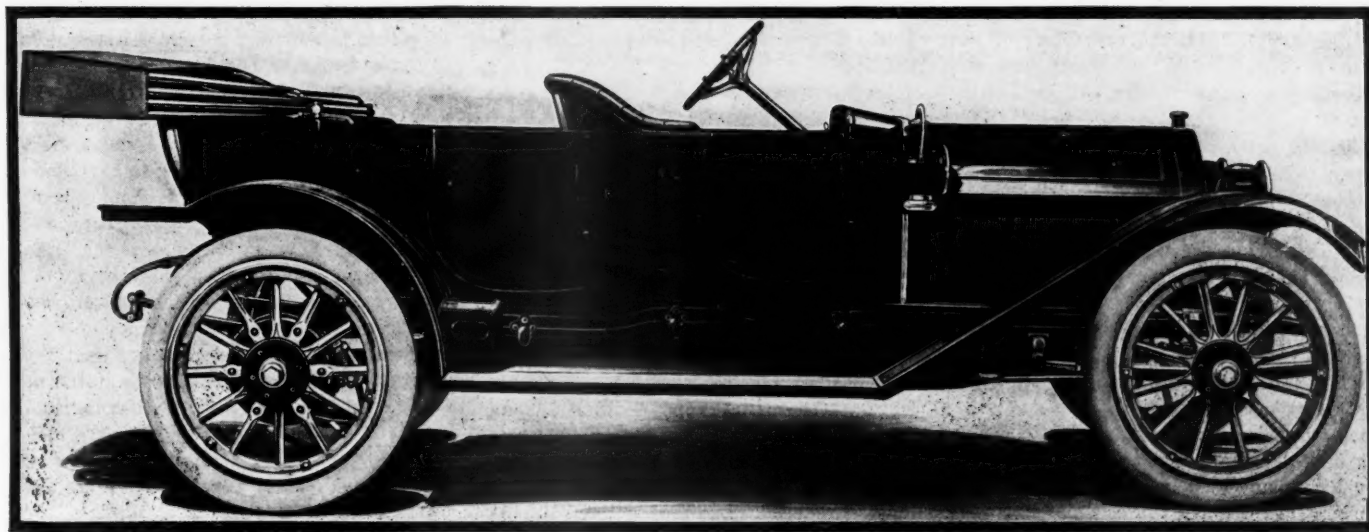
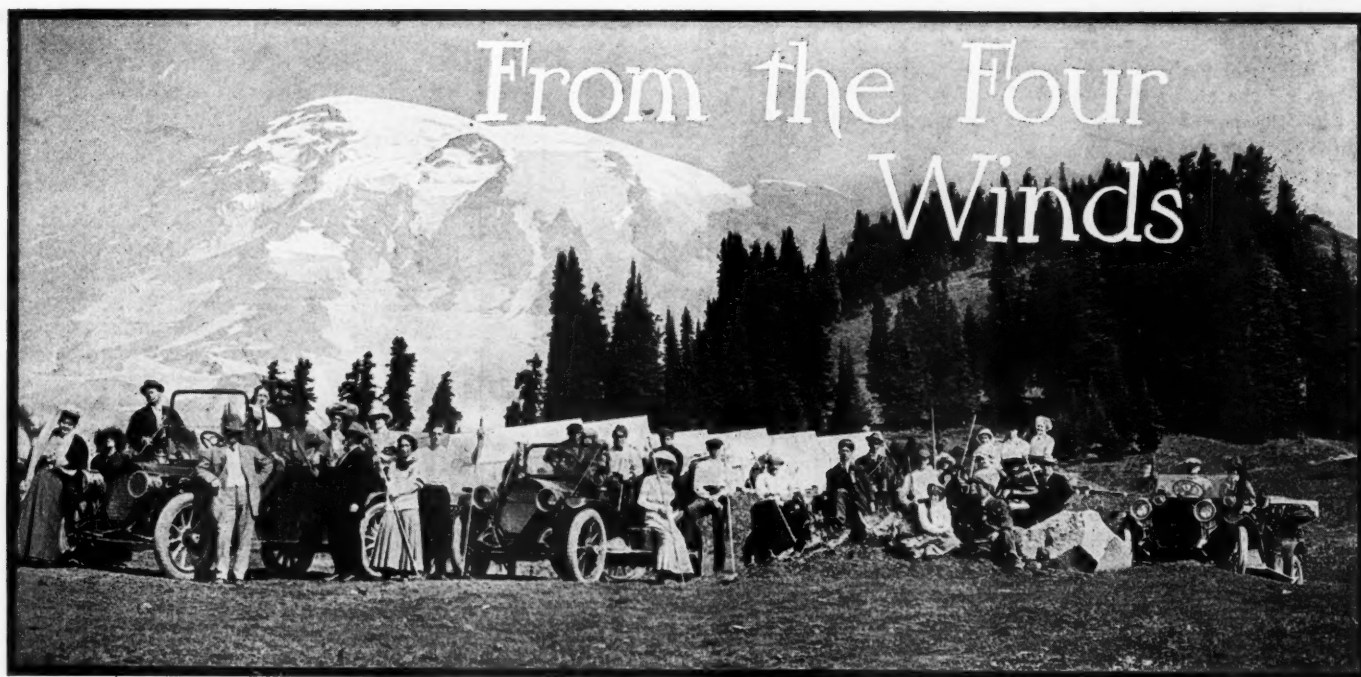


FIG. 9—COLE 30-40 FORE-DOOR TOURING CAR



ROTARY CLUB AT CAMP OF CLOUDS, 7,000 FEET UP MOUNT TACOMA IN WASHINGTON

MONTREAL Has 1,300 Cars—According to the license bureau, Montreal can boast today of 1,300 cars.

Club Gets Out Tour Book—The Automobile Club of St. Louis is compiling a book of short tours about the surrounding country. This is the most important work of the kind which the club has so far undertaken.

State to Post Signs—State Highway Commissioner E. M. Bigelow of Pennsylvania is obtaining from his assistant engineers complete data as to where sign posts are needed in their districts. The signs will be enameled on metal like the license tags.

Helps Road Builders—County road building movements in Ohio will profit through an opinion from the attorney general's office to State Highway Commissioner James R. Marker. It has been decided that where counties made application for state aid under the old law prior to January 1, 1911, the enactment of the McGuire law, revising the road laws and repealing sections of the old laws, does not affect these petitions and the counties will receive their money from the state treasury.

Grant Joins Lozier Team—Ever since the Alco company announced its intention of withdrawing from racing much speculation has been indulged in as to the racing plans of Harry Grant, who has been responsible for Alco victories in the past. Grant has no intention of giving up the sport and the announcement has just been made that he has selected the Lozier as his new mount and will make his first appearance as a Lozier driver in the Fairmount Park race, October 9. The Lozier which he will drive is the 46-horse-power 1912 model owned by Dr. W. H. Chambers, a physician of Pittsburg. It is

probable that the car will compete not only at Fairmount but in the big southern events as well.

New Michigan Club—Buchanan, Mich., is planning to organize a club to be composed of motor car owners in Buchanan and vicinity. A club house also is planned, which would be centrally located and containing modern conveniences for the accommodation of the members, especially the farmers when they come to town.

State Has Road Exhibit—A feature of the state fair at Corvallis, Ore., recently was the general display of the best methods of construction of the various kinds of roads. Professor E. F. Ayres of the Oregon Agricultural college, of the highway construction course this year, was in charge of the exhibit.

Hoosier Club Thriving—It is expected that a permanent organization of the Hoosier Motor Club will be perfected at a meeting of motor car owners to be held at the Claypool hotel, Indianapolis, on the evening of September 29. There will be a dinner and smoker in connection with the meeting and it is expected the club will start with 100 charter members. Charles A. Bookwalter will serve as temporary chairman and P. P. Willis as temporary secretary.

Club at Taunton—Taunton has joined the list of Bay State cities that is represented now by its own motor club. There were about twenty-five motorists on hand and many of them stated that they had been told by other owners of cars unable to be present that they could count on them when the club was formed. The following officers were chosen unanimously: Dr. Arthur R. Crandall, president; Frederick Ludlam, vice-president; Richard Wescott, secretary-treasurer. The above officers were also chosen directors

with the following: Arthur C. Staples, Frank O. Dean, Dr. Ralph D. Dean and Pardon B. Sanford.

Seattle Sidesteps Congestion—Max Wardell, president of Seattle's city council, has had passed a measure to regulate the operation of vehicles of every character on the streets of Seattle. By its provisions it is made unlawful to allow any vehicle, motor car or newspaper cart to stand on the downtown streets between 4:30 and 6:30 in the afternoon of any day in the week.

Yellow Bands for Road Markers—Yellow bands on the telephone poles will be used to mark the Omaha-Lake Okoboji highway. From Omaha to Denison the route is over the transcontinental and thence north to Kiron, Arthur and Schaller, then to Storm Lake, and then directly north to Okoboji. Painters will start to work putting the yellow bands on the poles at once.

California Statistics—Statistics taken from the books of Los Angeles transportation companies show that during the fiscal year just ended 1,800 carloads of motor cars were received in Los Angeles from the east, exclusive of boat shipments from northern points or tourist shipments east-bound. Since January 1, 12,243 motor car registrations have been made in the state of California. Averaging these at \$1,100 to the machine, approximately \$13,467,300 has been spent for motor cars alone in California. Apportioning 60 per cent for south of the Tehachapi gives a total of 55,200 cars registered in California and 33,120 in southern California, of which one-third, or over 11,000, are in the city of Los Angeles. In Los Angeles there are ninety-one car dealers, representing 157 different makes of cars. Approximately \$1,000,000 has been paid to the transpor-

tation lines alone by the southern California dealers to care for the 1,800 carloads of cars shipped to the California territory during the past fiscal year.

Omaha Race Card—The Omaha Speedway Association will pull off a series of 4 days' racing next Saturday, Sunday, Monday and Wednesday.

Athletes Helping Road Cause—Fred Moulten and Bill Hayward, famous University of Oregon athletes, are now engaged in placing red arrow signs stating the distance to Eugene, Ore., on every important turnpike along the north and south highway through the state of Oregon.

Lion in Buffalo Run—A typographical error in the table giving the results of the Buffalo reliability made it appear as if the Lion had been withdrawn because of an accident. Such was not the case, however. The Lion made a perfect road score but was penalized in the technical examination. It won its class.

Forming Pushmobile Association—So popular have the little pushmobiles become that the International Pushmobile Association is being organized in Indianapolis, which expects to sanction all pushmobile race meets. John Bookwalter, son of former Mayor Bookwalter, is president of the association. Pushmobiles are miniature motor cars, the power being supplied by a boy who pushes with a stick in the rear.

Stuart May Succeed Parker—George E. Stuart, deputy street commissioner of Newton, is being considered as the successor of Chairman Harold Parker of the Massachusetts state highway commission, now that the latter has sent in his resignation. The resignation of the chairman came as a big surprise and it is thought that it was the outcome of friction among the members of the commission. It is believed that whoever is given the appointment by Governor Foss will be made chairman.

Right Kind of Sign—Motorists traveling over the country come in contact with various signs at entrances of cities and towns. In many instances these signs are threats, imparting the information that unless the provisions and requirements of the speed ordinances are complied with the driver will be arrested and fined. These warning signs are not pleasing to the drivers, not that they have any desire to disobey the law, but that they dislike being regarded as outlaws, upon whose good behavior depends their chances of escaping from the law. A sign that commands the respect of every driver is on the roads leading into Lebanon, Ohio. It is said that after reading this sign every driver slows up and cheerfully obeys the order of the ordinance, paying particular attention to points of interest in the town and leaving it with a favorable and lasting impression. The sign

reads as follows: "Motorists, Please Speak Well of Lebanon. May We Speak Well of You. Hint: Drive Slowly."

Needs a New Home—The Automobile Association of York County, Pa., which was reorganized several months ago, has outgrown its present quarters and the members are looking for a permanent home of their own. The association has at present an active membership of 200.

Toledo Wants a Club—Plans are being made for the organization of a large motor club in Toledo. The idea got its inception last week when the dealers' association met for the purpose of electing officers. The club will not be a dealers' affair in any way and no one who sells cars will be permitted to hold office in the organization. Its membership will be made up of individual owners of motor cars. Until the organization is fully completed and has a substantial membership no clubhouse will be built, but instead a desirable building, a nice drive from the city, will be secured on a rental basis. Several such sites already are under consideration, but the final selection will be left to the officials after the organization has been effected. Initiation fees and dues

will be placed at a small figure, permitting all car owners to become members. It is thought that a membership of about 2,000 members can be secured.

Chicago Reliability Postponed—Because the dates clashed with the fall show of the Chicago Automobile Trade Association, the Chicago Motor Club has made a switch with its fifth annual reliability. In place of running it October 6-13, the big event has been set for October 27-November 3, which seems more desirable from a publicity standpoint, for then the world's baseball series will be over and the daily newspaper will have plenty of space in which to care for the motoring event.

Wheeler Building Apartment House—The finest apartment house in the world is to be erected at Thirty-second and Meridian streets, Indianapolis, by F. H. Wheeler, of Wheeler & Schebler, carburetor manufacturers. This will cost \$1,000,000 and work will be started within a short time. The building will be a four-story structure and suites will be of eight rooms each. There will be liveried servants and a feature will be a large garage in which each owner will have private quarters for his cars.



REPRESENTATIVES OF ROAD DEPARTMENTS OF MASSACHUSETTS, CONNECTICUT, NEW HAMPSHIRE AND DISTRICT OF COLUMBIA, WHO MADE TOUR OVER NEW YORK AND NEW ENGLAND HIGHWAYS FOR INSPECTION PURPOSES

Sees a Future for Electric Vehicles

New Jersey Expert Declares It Will Dominate Field of Application in City and Suburban Service to the Extent of at Least 70 to 80 per cent

IT is conceded by those familiar with road transportation that the electric vehicle will dominate the field of application in city and suburban service to an extent of from 70 to 80 per cent of the total number of vehicles employed, and estimates made of future requirements point to an annual demand for some 400,000 machines. In other words, the annual demand for electric vehicles will approximate 300,000.

The electric vehicle industry has reached a point of good business health, and the number of orders placed so far this year exceeds the total number of vehicles sold for the entire year of 1910, and 80 to 90 per cent of the orders placed are for additional equipment in existing installations, where the economies and advantages have been sufficient to warrant the entire replacement of the horse equipment.

Many Converts Made

Every electric commercial vehicle sold is a forerunner of additional machines for the same company, as is evidenced by the magnitude of the older electrical installations which have gradually grown from two or three machines to a dozen or more. There are forty large installations, which alone comprise over 3,000 vehicles.

It is as essential that motor vehicles shall be properly sold as that they shall be sold at all, as subsequent success depends largely, if not entirely, on the first selection, and to understand properly their application the prospective buyer must be educated to forget for the moment the tools with which the work is performed, and to consider his problem as one involving the transference of a given amount of merchandise over a given average distance in a given period of time. Unfortunately, the votaries of the ton-mileage and the cost-per-mile bases have succeeded to some extent in establishing these as units of computation in considering vehicle application.

It is essential that any improved machine or tool shall perform more work than that of existing apparatus at the same cost, or the same work at less cost.

Unfortunately, in the consideration of motor vehicle application to a transportation department, the fact that the machine represents an improved tool for the performance of existing work is lost sight of, and oftentimes its application is in an undeveloped territory, where the element of time required in running so dominates

EDITOR'S NOTE—At the meeting of the New England branch of the Electric Vehicle Association of America September 23 an address was delivered by Stephen G. Thompson of the Public Service Electric Co. of Newark, N. J., on "The Electric Vehicle and the Central Station."

the situation as to offset the economies which the vehicle presents. This is particularly true in the suburban delivery of merchandise from department stores.

In nearly all lines of business in which teaming or trucking forms a part of the day's work, this particular department merely presents the problem of transporting a certain amount of material—whose unit is variable with the character of the business—over a given territory. It is desired to perform this work at the least possible expense, and the problem then resolves itself to a matter of averages. An intelligent analysis will show for each unit of delivery a certain resultant cost, depending upon the character of the tools used. In department stores deliveries the unit is package, while in other lines it may be barrel, crate, case, tons or whatever is the nature of the material handled. The question is—what tool is the most economical, the horse-drawn vehicle, the electric vehicle, or the gasoline machine, and the one to be selected is the one which over an extended period will perform the work at the lowest average cost per unit.

The electric vehicle presents the advantage of an extended period of existence, so that the manufacturers are able to predetermine the operation costs for any given conditions, and there are few existing conditions to which electric commercial vehicles cannot be applied. However, in some cases the costs will exceed those of either horse-drawn or gasoline vehicles.

Field of the Electric

Trans-city and suburban delivery, embracing the interchange of merchandise between railway terminals and docks, stores and factories in the same city or community, and retail delivery in adjacent territories, presents the economic field of application of the electric vehicle; and interurban and inter-state transfer, covering the interchange of merchandise between more or less distant communities, in the main presents the economic field of railroad freight haulage. The application of gasoline motor vehicles lies between these two fields of merchandise transfer.

City and suburban delivery may be classified under two heads, heavy trucking and light delivery service. The former embraces principally the interchange of merchandise of great weight and bulk between freight terminals and warehouses, and from wholesale business houses to retail, where the streets traversed are generally within the city limits. Here

the increased efficiency of the electric vehicle finds a large field for economy, and it is not uncommon that one machine will replace two or more horse units of equal capacity.

Light delivery service embraces the transfer or haulage of merchandise to the suburbs as well as in the city proper, and analyses show that the economic zone of operation is within a radius of approximately 20 miles of the base of operation. The governing factor, however, is the number of packages delivered in a given territory. It is unfortunate that business competition has led to an abuse of the free delivery system, and oftentimes merchandise now delivered in a territory far removed from the economic zone of operation entails a loss on nearly every parcel delivered. Such practice is foreign to the province of the delivery system of the department store, and is entering the field of the local express company, which automatically transfers the base of operations to a center of distribution in a new zone of delivery, and can operate vehicles from this new base economically, because of the bulk of business secured from a number of stores, which, if operating individually, would be doing so at a loss.

Free Delivery System

Merchants must soon come to a realization that a free package delivery system has its limitations, and that the logical method of increasing their zone of activity is by employing a common carrier in fields beyond the economic radius of delivery from their own base of operation. Advocating such procedure is probably too far in advance of the time for it to meet with favorable consideration by individual merchants, especially as instances exist wherein enterprising business houses have gained control of the local express company, to the exclusion of their competitors. The attitude taken, however, is illogical, and recalls the fable of the dog in the manger. It is surprising that shrewd business men should continue a practice which to each represents continual loss, rather than that one or two shall secure the business in a particular section at a profit.

The result of investigations of existing transportation conditions in Boston and the surrounding towns is illustrative of the results which may be obtained from the proper application of electric vehicles in trans-city service from suburban delivery.

There is a daily haulage of 25,000 tons of material in the city proper in a territory approximately 2 miles long by ½ mile wide, and an analysis of horse haulage conditions covering a portion of this work involving 600 tons daily showed an annual saving of \$27,000 on a horse operating cost of \$68,000. Therefore, for the

Operating Within Zone of Business

25,000 tons hauled, a proper application of electric vehicles would show an annual saving of \$1,125,000. The investigation further showed that in the operation of the horse-drawn vehicles the unloaded mileage was equal to 60 per cent of the loaded mileage. In the contemplation of electric vehicles, means were devised for the elimination of a large percentage of this unloaded mileage, thereby obtaining the highest efficiency from the machines.

A study of the package delivery service of one of the leading department stores showed the zone of economic operation of electric vehicles to embrace a territory within a radius of 17 miles of the base of operation, and further showed an annual saving of \$16,500 effected on an operating cost of \$48,600, the additional investment in machines over the present horse equipment being \$33,800. From these figures it is not difficult to comprehend what a vast saving could be effected by the wholesale application of electric vehicles to these two departments of road haulage in Boston.

Computing Cost of Operation

In computing the cost of operation of electric vehicles the majority of charges known as overhead, such as interest, depreciation, rent, etc., are fixed, the variable figures applying only to the wearing parts of vehicles, covering batteries, tires and mechanical replacement, or up-keep. These items, however, vary only with the characteristics of the service to which the vehicle is applied, so that, if the conditions are known, the annual cost of operation may be quickly predetermined.

The electric vehicle is designed with a power equipment in accord with the daily work performance, be it on heavy grades or level roads, whether the critical features be long or short hauls, light or heavy loads, rapid transit or slow, bulky transfer. The question of mileage obtainable from that portion of the battery which economy dictates should be carried at one time in the vehicle, in no way affects its operation in the day's work performance; that is to say, where the characteristics of the service call for infrequent stops and long haulage, operating from a base to which the vehicle returns for additional loads, oftentimes it is desirable to divide the battery capacity into two or more sections, thereby obviating carrying unnecessarily during the morning's performance that portion of the battery required for the afternoon's work. In returning to the base of operation, a change is made, and another section of the battery is substituted for the one in the vehicle, which involves no more labor than is employed in the harnessing of a horse.

The factors governing the application of motor vehicles to merchandise trans-

fers are road conditions, the number of deliveries, traffic congestion, continuity of service, and man time—that is, the time employed by the operator in performing his functions as a delivery agent, and maximum average speed available, including stops.

To what extent these factors affect vehicle operation is shown in the following record, taken from an engineer's observations of actual vehicle performance in department store delivery:

Store.	Time running on route Minutes	Time delivery on route Minutes
Stop		
1	0	1
2	1	1
3	1	1
4	0 1/4	1 1/4
5	1	1
6	1 1/2	0 1/2
7	2	1 1/2
8	1 1/2	1
9	1 1/2	1 1/2
10	0 1/2	1 1/2
1	2	0 1/2
2	0 1/2	6
3	1 1/2	1 1/2
4	3	0 1/4
5	2 1/4	1
6	1 1/2	2
7	1	0 1/2
8	1 1/2	1
9	2 1/2	3
10	5 1/2	1
1	2 1/2	1 1/2
2	0 1/2	0 1/2
3	0 1/2	0 1/2
4	2 1/4	0 1/4
5	2 1/4	1
6	0 1/2	1 1/2
7	0 1/2	2
8	7	2 1/2
9	3	0 1/2
10	2	1
1	0 1/2	1
2	2 1/2	0 1/2
3	0 1/2	2
4	2	4 1/2
5	4	0 1/2
6	4	0 1/2
7	4	0 1/2
8	1	1
9	2	0 1/2
10	1 1/2	1 1/2
1	0 1/2	1
2	1 1/2	1
3	0 1/2	1
4	0 1/2	1
5	1 1/2	1
6	6	4
7	6	21
8	4	2
9	1	1
10	1	2
Return to store		
Totals	96%	87 1/4
Time running off route, 30 minutes		
Average speed M. P. H., including stops, 3.7		
Average running speed on route, except stops, 23.8		
Miles traveled, 15.5		

Records of Vehicles

This tabulation is selected from one of a number of records of vehicle operation with an electric machine, capable of a maximum speed of 12 3/4 miles per hour. It will be observed that the maximum speed which the vehicle attained was 8.8 miles per hour when returning to the store from the last stop, traffic conditions preventing a greater speed, and the average speed on the route, including stops, for a distance of 11.3 miles, was but 3.7 miles per hour. It is further shown that the delivery time—that is, the man time—was equal to 90 per cent of the running time.

The following tabulation shows the relative percentage of cost for the different items which go to make up the an-

Figures Offered Which Show Practicability of the Type Which, It Is Claimed, Has Many Advantages Over Gasoline-Propelled Machines

Annual operating expenses of electric vehicles of 1 ton and 5 tons' capacity, respectively:

	1 Ton	5 Ton
Overhead:		
Interest	3.4	3.7
Depreciation	11.3	12.8
Insurance	4.3	3.3
Rent, etc.	4.2	3.5
	23.2	23.3
Maintenance:		
Tires	6.4	17.9
Batteries	10.8	14.
Mechanical	8.5	7.6
Lubrication	0.2	0.2
	25.9	39.7
Labor	43.4	28.
Current for charging	7.5	9.
	100.0	100.0

Cost of Mechanical Maintenance

Simplicity of construction is accountable for the low percentage of cost for mechanical maintenance. The power plant of the electric vehicle, the electric motor, has but one rotating moving part, no reciprocating motion, and no vibration. It is the same as for years has been successfully operated in street railway service; and, in fact, the vehicle may be considered as a miniature street car, except that its power is carried with it instead of being transmitted over a trolley, and it is unconfined as to route or rails.

The presentation of the electric vehicle to the public, and its adoption, entails problems foreign to the province of both the power salesman and the electrical engineer, namely, questions of merchandise transportation, and not solely of electricity. This emphasizes the necessity for the employment by the electric lighting companies, either collectively or individually, of some one especially trained in transportation engineering and familiar with the requirements and intricacies of vehicle application.

While it is rather difficult to prescribe methods of procedure to fit the individual characteristics of the lighting companies in the various parts of the country, an outline of the work pursued by the Public Service company in developing the electric vehicle field may at this time be interesting.

Two hundred and four representative concerns in Newark were first selected, to whom letters were sent suggesting an interview with the engineer of their motor car department. Forty-five replies were received, and in pursuing them a majority were found to be particularly promising. The results of this initial move showed a desire on the part of horse-vehicle operators to learn about electric vehicles; therefore, a systematic educa-

tional campaign is being instituted, which not only provides for the distribution of literature appertaining to electric vehicle application, but also a follow-up system to observe the effect of the circularization and the progress of the work. The territories served by the Public Service lines are divided into six sections, each of which is centrally controlled by a division agent and subdivided into districts. In each district power men are assigned to the work of the motor car department, which forms a force of thirty-two men active in the field. Each division agent has provided a list of those business concerns in his territory which appear to be likely buyers of electric vehicles. The combined lists approximate 1,900 names, and constitute the present mailing list.

Promoting Interest in Electrics

The vehicle manufacturers who are sufficiently interested in this work to maintain permanent representation in New Jersey have been selected to co-operate with the company in pursuing the following programme for the promotion of the use of electric commercial vehicles:

To each company on the mailing list one of a series of pamphlets of a semi-technical character from the Public Service Electric Co. will be mailed each month.

Each of the manufacturers will provide a similar series of literature, to be distributed at regular intervals by the Public Service Electric Co.

The power solicitors assigned to the motor car work will supplement this circularization by personal calls, and report on their interviews on special forms to the automobile department.

The local representatives of the manufacturers will expend their efforts principally on those prospects apparently nearest the point of closing.

In other words, the Public Service Electric Co. will perform the necessary missionary work in order that the vehicle manufacturer may concentrate his energy on the immediately active prospects.

This program provides for the following:

- 1.—The consistent, continuous presentation of the electric vehicle to 1900 representative business concerns.
- 2.—Periodic distribution of literature.
- 3.—Systematic solicitation.

The reason for the control by the Public Service Electric Co. of the mailing of the literature of the vehicle manufacturers is to prevent spasmodic circularization, although it is intended that the manufacturers shall be entirely unrestricted, and all will be provided with a copy of the mailing list, so they may circularize further, should they so desire.

Monthly Lectures Suggested

A series of public monthly lectures presented by prominent men in the motor car industry is being conducted, as well as educational meetings for the power salesmen of the Public Service Electric organization.

A similar method of procedure in electric pleasure work is to be pursued, but the details have not yet been fully determined.

A contract has been placed by the Public Service Electric Co. for the erection of an elaborate talking sign at the busiest corner in Newark. Also both commercial and pleasure vehicles have been purchased for use in the various departments.

In advocating the use of electric vehicles, the lighting companies occupy an enviable position in that they are unrestricted as to peculiarities of design or any particular make of car, which is not true of the salesmen representing any one product. Care must be exercised that these conditions continually prevail, and the lighting companies must avoid any seeming preference for any particular make of vehicle or accessory.

It is not within the province of the lighting companies to analyze the constituent elements of the electric vehicle and pass judgment on its design and general makeup. It is at best a compromise, and its present perfection has been brought about through a succession of trials and a long period of development. Any electric vehicle manufacturer who has machines in consistent performance for periods of 3, 4 and more years, and has the financial backing to assure his stability, should receive as much recognition as any other.

The power solicitor of the lighting company has the advantage of close personal relations with the majority of business concerns in his section, and is better able to perform the missionary work necessary to secure electric vehicle consideration than is the vehicle salesman, who, having something to sell, must combat the reluctance of the purchaser to part with his money, especially if the project is new.

The combined efforts of all will help wonderfully in the development of this source of income, and will hasten the time when present investments will be productive of dividends. This business is attractive, showing an annual income of \$75 per kw. of connected load.



ARGENTINA and Her People of To-day" deals with the advancement of the people in the last 25 years, socially and politically, with a comprehensive statement of the resources of the country. "With the single exception of Brazil, Argentina is the largest country in South America. It is as large as the United States east of the Mississippi river, with a state the size of Texas added. It is twelve times as extensive as the British isles and five times the size of France," says Nevin O. Winter, the author. It is a land of big things, where the farms consist of several thousand acres and grains are measured by the ton instead of the bushel. The people have money and they spend it freely. They want the very best, and nothing is too good for them; they are accustomed to paying high prices, and money seems of little moment to them when once the de-

sire for the article exists. Therefore it is not a cheap market that awaits the American manufacturer. But one thing, however, "the North American manufacturer must learn is to be very careful in putting every necessary part in the shipment. Several times engines or other complicated machinery have been received and when it was put together some part would be missing. As it takes 3 or 4 months to get the missing part, the customer loses a season's business and the trade would go to England as there was no danger there of that kind of trouble." Such reports, or similar ones, were quite frequent, Mr. Winter found. "It is a discriminating field, and the idea that anything is good enough for that continent has been exploded." He further says: "An American bank would greatly facilitate business, as American manufacturers should study the market and send salesmen who understand the languages, the people and the customs, and establish independent houses with hustling Americans in charge and not trust to foreign representatives who have a natural predilection for things in their own land. A little attention to these principles will help in solving the questions of American trade in South America." It would be well for manufacturers to inform themselves upon the country and its resources. L. C. Page & Co., Boston.

Hand Book of Mexico

In a 390-page cloth-covered volume the Pan-American Union, Washington, D. C., has compiled valuable statistical information on the topography, climate, resources, commercial and industrial life of Mexico. To those interested in the growth and future possibilities of our sister republic the book will be found of value, presenting as it does the many phases of the country in a practical and useful manner. Price \$1.

Club Tour Book

Bound in flexible morocco with the insignia and title of the club in gold, the tour book of the Automobile Club of America is a voluminous affair, consisting of 900 pages. The routes outlined are divided into four sections: Hudson river east, Hudson river west, the south and the middle west and the west. A symbol system is employed in the route description. Other information, such as the state motor laws, ferry and steamboat connections, instructions for foreign tours, foreign laws, etc., all of which is information a motorist wants to know, is included in this volume of tours. Price \$4 to non-members.

Engineering Index Manual

The "Engineering Index Manual" for 1910 is an index to engineering and technical literature published during that year. The items are classified according to the division of engineering practice to which they belong—civil, mechanical, electrical, mining, etc.—and these are again subdivided and grouped according to the recognized special division of each field. Published by the Engineering Magazine, New York.



Brief Business Announcements



COLUMBUS, Wis.—A new garage is being built here for G. A. Lien.

Columbus, O.—Edward Miller, 705 Ann street, has taken the central Ohio agency for the Premier.

Chicopee Falls, Mass.—H. B. Curtiss was recently placed in charge of the factory service department of the Stevens-Duryea Co.

St. Louis, Mo.—Gratit Cabanne has been appointed manager of the Olds Motor Works branch in St. Louis, succeeding W. B. Fewell.

Des Moines, Ia.—The Cole Motor Co. has moved into enlarged quarters on Twelfth street, having moved from the former location on Fifth street.

San Antonio, Tex.—The Fred P. Warren Co. has obtained the agency for the Hudson and will have this territory with its sub-agencies in handling that car.

Columbus, O.—Fred A. Kaiser & Co., 38 West Main street, has taken the agency for the Bergdoll for the entire state of Ohio, excepting Hamilton and Cuyahoga counties.

St. Louis, Mo.—The office and salesrooms of the Haynes Automobile Co. have been moved to 419 North Euclid avenue. The concern handles the Haynes and Paige-Detroit.

Columbus, O.—The Robert F. Boda Automobile Co., of 25 North Fourth street, has closed contracts to handle the Mitchell in eighteen counties in central Ohio for 1912. The same company will cover fourteen counties in central Ohio for the Thomas.

Philadelphia, Pa.—New quarters have been established by the Century Automobile Sales and Supply Co., at 520 North Broad street. In addition to a complete line of accessories, the company will be the agent in Philadelphia and vicinity for the Pathfinder car.

Lansing, Mich.—A new concern known as the Central Welding Co. has been organized by J. E. Rork and H. D. Weise of this city. The company is located on Franklin avenue. Besides making a specialty of welding motor car parts, the company also welds general machinery parts.

Pittsburgh, Pa.—The Clark has secured an entry in Pittsburgh. The Pittsburgh district manager will have under him 110 counties in western Pennsylvania, eastern Ohio, western Maryland and West Virginia. The principal offices will be in the Hilland building, east end, for the present. Meanwhile arrangements are being made to secure a long lease hold on a large east end property where a retail show room and garage will be built this winter. The corporate name of the organization that will promote the interests of the Clark car

in this territory will be the Williams-Hasley Motor Car Co., Ltd.

St. Louis, Mo.—T. H. Burns has been appointed sales manager for the Superior Motor Sales Co., 2007 Locust street.

Columbus, O.—The Snyder Auto Co., 765 East Long street, has closed a contract to handle the Abbott-Detroit in all of central and southern Ohio for 1912.

Logan, O.—William Loomis, of Logan, has opened a garage and livery business at Wellston, O. Associated in the business is J. L. Fleming, also of Logan.

Philadelphia, Pa.—The Philadelphia agency for the Universal and Federal commercial vehicles has been secured by the Fischer Motor Car Co., 310 North Eleventh street.

Ellsworth, Wis.—C. W. Morton of this city and Alfred Larson of Moeville, Wis., have formed the Morton-Flanders Co. and will act as district agents for the E-M-F and Flanders.

San Francisco, Cal.—The northern California agency for the Oakland has been taken by the Consolidated Motor Car Co. The latter for the past 2 years has been distributor of the Pope-Hartford car exclusively.

Washington, D. C.—The DeTamble agency has been given to the Ohio Motor Sales Co., which also handles the Ohio at 302 Sixth street, N. W. Extensive improvements and alterations in their garage and salesrooms have just been completed.

Indianapolis, Ind.—Recent Cole agency appointments are: Van Duyn & Mathias, Springfield, Ill.; Economy Auto Co., Oskaloosa, Ia.; E. S. Kinley, 410 Jackson street, Topeka, Kas.; Thibaut Motor Co., Napoleonville, Ia.; Hennings garage, Mount Vernon, N. Y.; E. Garber, Washington, Ill.

San Francisco, Cal.—B. F. Jacobs, sales manager of the Motor Car Mfg. Co., of Indianapolis, has placed the northern California agency for the Pathfinder and Parry cars with the Motor Car Mfg. Sales Co., of San Francisco. W. Covell and W. H. Weeks, of Watsonville, have organized the company especially to handle these two cars. Russell Cuthbert is sales manager of the company.

Richmond, Va.—The state corporation commission has issued a charter to the Motor Truck Corporation, of which H. A. Gillis is president. He was formerly superintendent of the Richmond branch of the American Locomotive Co. The new concern will have its principal office in Richmond. The incorporators are: H. A. Gillis, president; T. M. Garrity, secretary and treasurer; Charles Laurens, vice-president, all of Washington, and E. P. Cox, of Richmond. The capital stock is \$25,000 maximum; \$10,000 minimum. The objects and

purposes to operate a motor transfer business.

Denver, Colo.—C. W. Keith, of 1545 Wazee street, is handling the Imperial car.

St. Louis, Mo.—Announcement is made that the Cutting car is to be sold in St. Louis by the Chicopee Motor Car Co., 5145 Delmar boulevard.

Denver, Colo.—The Auto Equipment Co. announces that it will move, next month, into larger quarters at 1528-30 Broadway, two doors north of its present location.

Des Moines, Ia.—W. R. Jones has been named manager and has taken charge of the Des Moines branch of the United States Motors Co. He succeeds H. B. Groves, who has gone to the Pacific coast.

Wilmington, Del.—Two new agencies have been established in Wilmington in the past week, the Delaware Machine Co., at Front and Orange streets, having taken the agency for the Cadillac, and Max Matthes of Third and Orange streets the agency for the Virginian car.

San Francisco, Cal.—The White gasoline pleasure cars are now handled in San Francisco by the Davis Auto Co., organized for the purpose. The White company's branch here retains the truck end of the market. Frank H. Davis, long associated with the White branch, is manager of the Davis Auto Co.

Wilmington, Del.—The T. C. Bradford Co., at Tenth & Tatnall streets, and the Wilmington Automobile Co., nearly opposite on Tenth street, have announced that they will handle new lines, the former having taken the agency for the Premier and the latter for the Chalmers car and Alco truck. The Gemery-Schwartz Motor Co. has established a Hudson-Garford agency at Fifth and Orange streets.

Philadelphia, Pa.—A structure at 319 North Broad street will henceforth be the Quaker City home of the Packard Motor Car Co., of Philadelphia. The new building is eight stories in height and built of steel and reinforced concrete. On the first floor, facing Broad street, are the show rooms, adjoining which are the offices of the manager, sales manager, technical staff and the salesmen. In the rear is the service department. On the second floor are the general offices, truck department and stock room. The third and fourth floors are devoted to a used car salesroom and the storage of bodies and cars. On the fifth floor is located the paint shop, while the sixth and seventh floors comprise one of the most complete repair shops in the city. The top floor is occupied by the truck repair shop. The company owns the whole block, 302 feet in depth, upon which, should business devel-

opment demand, the present building could be duplicated.

Newark, N. J.—The Johnson Auto Conveyance Co. has been established here, the company employing four Johnson trucks for its freight carting business.

Seattle, Wash.—Ross B. Cooper is now associated with the Seattle branch of the Mitchell Motor Car Co., which recently established a factory branch in this city.

Columbus, O.—J. P. Adamson, 35 West Mound street, will handle the Jackson in nine counties in central Ohio for 1912. He will also handle the Dart motor truck manufactured at Waterloo, Iowa.

Denver, Colo.—J. J. Armstrong & Son, of Canon City, have been made National agents for Fremont county in which Canon City is located. G. W. Blake will handle the National in El Paso and Teller counties, the Colorado Springs territory.

Richmond, Ind.—W. D. Mercer, recently connected with the Marquette Motor Car Co., of Saginaw, Mich., has resigned, and is now connected with the Westcott Motor Car Co., of Richmond, Ind. Mr. Mercer will act as district manager for Illinois, southern Indiana and southern Ohio.

Columbus, O.—The Curtin-Williams Automobile Co., 84-86 North Fourth street, has taken the agency for the Cadillac in twenty-two counties in central Ohio for 1912. Most of the territory will be covered by the company directly, although several subdealers will be appointed.

San Francisco, Cal.—The Pioneer Commercial Auto Co., of Los Angeles, has established a branch in this city for the handling of the Reliance, Rapid and Randolph trucks, all of the General Motors line. F. W. Ball is in charge. Temporary quarters at Van Ness and Golden Gate avenues are now occupied.

Indianapolis, Ind.—The Haynes Automobile Co. has opened a factory sales branch in Indianapolis at 514 North Capitol avenue, with R. P. Dillon as manager. A factory sales branch of the Auburn Automobile Co. has been established at 518 North Capitol avenue. Formerly the Auburn was handled by the Finch-Freeman Auto Co.

Indianapolis, Ind.—Mais motor truck agencies appointed recently are as follows: Dye & Gardner, Monticello, Ind.; A. Goyert, Greensburg, Ind.; McLeary Engineering Co., Toledo, Ohio; Pacific Motor Car Co., San Francisco, Cal.; Catskill Auto Co., Catskill, N. Y.; Foster Motor Sales Co., Detroit, Mich.; Grant Brothers, Marion, Ind.; Federal Motor Car Co., Pittsburgh, Pa.; Davies, Van Sicklen & Coey, Chicago; Stewart Automobile Co., New York; Selden Motor Car Co., Boston, Mass.; Bartlett Garage Co., Philadelphia, Pa.; Phillips Automobile Co., St. Louis, Mo.; Jersey Motor Car Co., Los Angeles, Cal.; Carl Van Sciever, Cleveland, Ohio; Fairfield Auto Co., Bridgeport, Conn.; John Van Benschoten, Poughkeepsie, N. Y.; C. F. Weeber Mfg. Works, Albany, N. Y.; C.



H. Solliday, Dayton, O.; Renton Motor Co., Los Angeles, Cal.

Rockford, Ill.—The Rockford Truck and Garage Co. This is a concern recently organized here.

Omaha, Neb.—Guy L. Smith, dealer in Franklin and Peerless cars, has recently taken the agency for the Hudson.

Columbus, O.—The Columbus Auto Inn, Sixth avenue and High street, has taken the agency for the Reo and Zimmerman for 1912.

Portland, Ore.—Dulmage & Smith, agents for the Elmore and Rapid trucks, have just closed for the Hupmobile, formerly handled by the Smith-Cleveland Co.

Toledo, O.—John Johns has taken over the business of the Maplewood garage in Toledo and announces that he will make extensive improvements. Mr. Jones has closed a deal whereby he will handle Zimmerman cars in northwestern Ohio.

Grand Rapids, Mich.—The Mercury Mfg. Co. has chosen Grand Rapids as the place to enter into Michigan competition. Its first branch in this state has been established at 318 Kent street. The company is represented by James Hoogerhyde and C. Fisher.

Indianapolis, Ind.—The Firestone Tire and Rubber Co., of Akron, Ohio, has decided to open a branch in Indianapolis, and is looking for a suitable location. W. L. Easterly, Indiana representative for some years past, will be made manager of the new branch.

Kenosha, Wis.—The Chicago Brass Co., of Kenosha, Wis., has purchased the buildings and real estate of the Frost Mfg. Co., which has been specializing in plumbers' goods, and will add the property to its already large plant. The two plants adjoin and the purchase gives the Chicago company a solid block.

Oakland, Cal.—Capitalized at \$500,000, of which \$280,000 has been subscribed, the S & D Motor Vehicle Co. has been formed here, the directors and subscribers being Charles Schmidt, B. E. Duckworth and A. A. Montague. All are residents of Oakland. This firm intends to manufacture motor vehicles and deal in them.

San Francisco, Cal.—The Indian Refining Co., of New York, manufacturer of Havoline oils, has organized the Indian Refining Co. of California as a subsidiary corporation to handle its products on the Pacific coast. Offices have been established in this city in charge of H. R. Gallagher and J. D. Van Eck, and arrangements are being completed to take care of the entire coast trade from this city. For several years Havoline has been handled in the west by W. P. Fuller & Co., of this city, through a selling agreement with the

Indian Refining Co., but this arrangement has now been terminated.

Portland, Ore.—L. C. Becker is now Lozier distributor in Portland.

Savannah, Ga.—T. A. Bryson will handle the Packard and the Chalmers for the coming season.

Hartford, Conn.—Kilby & Barrett have taken the local agency of the Russel truck for this section.

Savannah, Ga.—The Savannah Auto Co. has taken on the agency for the Mercer and the Cadillac.

Bridgeport, Conn.—Setzer & Beach, Cole representatives at Bridgeport, have taken permanent quarters at 361 Fairfield avenue.

Kokomo, Ind.—Thomas Burke has been appointed special representative for the Haynes Automobile Co., and will look after placing agencies for the Haynes car for Indiana.

Seattle, Wash.—L. McClure, of Seattle, has acquired the location and business interests of the Duro Motor Co., at 1418 Broadway and is arranging to take on a line of cars.

Oklahoma City, Okla.—The Jonz Automobile and Supply Co., with headquarters at Kansas City, Mo., has opened a branch office in Oklahoma City at 13 Harrison avenue. Dr. F. P. Brocett is the manager of the local office.

Columbus, O.—J. P. Adamson, agent for the Jackson in central Ohio, has closed contracts with J. E. Lawrence, Lancaster, O., and H. W. Herrick, Urbana, O., to act as agents for the Jackson in Fairfield and Champaign counties, respectively.

Philadelphia, Pa.—Announcement has been made of the removal of the Central Auto Supply Co. into larger and better appointed quarters at the southwest corner of Broad street, Ridge and Fairmount avenues. Frank Stehle is the manager.

South Bend, Ind.—R. M. Seely, formerly of this city but more recently of Detroit, Mich., has opened a motor car training school at 130 South Main street. Mr. Seely will also deal in rebuilt and used cars and will also handle a line of accessories.

Indianapolis, Ind.—K. W. Brewer and E. L. Baker have formed the Baker-Brewer Co. in Indianapolis and have taken the agency for the Baker electric. They have obtained quarters with the downtown salesroom of the National Motor Vehicle Co. at 426-428 North Capitol avenue.

San Francisco, Cal.—F. W. Lloyd, representative of the Velie Motor Car Company, is now in San Francisco making arrangements for the future representation of the Velie in northern California. For the past 3 years, the Velie has been handled by the Standard Motor Car Co., but the latter's appointment as coast distributor for the United States Motor Co.'s Stoddard-Dayton and Courier lines compelled it to relinquish the Velie. Lloyd states that it is still uncertain whether an

agency will be appointed or a factory branch will be established.

Baltimore, Md.—The D. C. Walker Auto Co. has become the Baltimore representative for the Stearns.

Savannah, Ga.—L. W. Hazzard, formerly of Hazzard & Brockegt, has the E-M-F and Maxwell for next year.

Stevens Point, Wis.—G. A. Gullickson and P. W. Holte have opened a motor livery and garage on Ellis street and Strongs avenue.

Burlington, Wis.—Edward Zwiebel & Brother, agents for the Rambler and Overland, have moved into their new garage on Chestnut street.

Boston, Mass.—The Henry Motor Car Co. that handles the Henry for New England is being reorganized so that it will have a larger working capital.

York, Pa.—The York Garage and Supply Co., 116-118 East Market street, has taken the agency for the Hudson, Pullman, Everitt and Stearns cars.

Boston, Mass.—E. V. Kidd, who has been with the Boston branch of the Maxwell, has resigned and accepted a position on the sales force of the Hollander Motor Car Co. to handle the Metz.

Baltimore, Md.—The Lambert Automobile Co. is preparing to occupy the new quarters at Mount Royal and Maryland avenues. The company handles the Maxwell, National and Hudson cars in Baltimore and vicinity.

York, Pa.—C. C. Fairman and C. M. Colgrove, of the Windsor Motor Car Co. of Buffalo, N. Y., have taken the agency for the Klinekar. J. T. Thomas, of Youngstown, O., has taken the agency for the 1912 line of Klinekars.

St. Louis, Mo.—The Kisselkar company has opened a branch house in St. Louis with George Dunville, who has been selling the car here for some time as branch manager. The business will be continued at 1312 South Grand avenue, where Dunville has had salesrooms for a year.

St. Louis, Mo.—Manning W. Cochrane, a St. Louis grain dealer, has entered the motor car trade and announces that his concern, the Cochrane Motor Sales Co., is to handle the Gramm truck. The office will be at 304 Merchants' Exchange building until salesrooms can be opened on Locust street.

Indianapolis, Ind.—One of the most modern and unique garages in Indianapolis is being erected in Pratt street, between Meridian and Pennsylvania street by the Auto Owners' Service Co. It will be 106 by 122 feet, absolutely fireproof, of yellow pressed brick trimmed in white. The colonial style of architecture is being employed. There will be capacity for eighty-five cars on the first floor. At the front of the second floor will be living apartments, while in the rear of this floor will be a repair and machine shop. Cars will be delivered by employees in white uniforms

and there will be a vacuum cleaning system for the upholstery of the machines.

Des Moines, Ia.—The Cunningham Auto Co. has taken the Des Moines agency for the American Traveler.

Middleton, Mich.—William Mertz is constructing a modern garage on the west side of Newton avenue. The building will be of brick and will be 45 by 100 feet in dimensions.

Portland, Ore.—The Portland Motor Car Co. announces the appointment of Monroe Goldstein as sales manager for the Abbott-Detroit cars and advertising manager of that concern.

Cincinnati, O.—A three-story fireproof building to be erected on Race street near Twelfth, will be occupied by the Morgan & Wright branch of the United States Tire Co., now on Main street between Seventh and Eighth avenues.

St. Louis, Mo.—The St. Louis Automobile Sales Co. has been incorporated to take over the plant and good will of the Times Square Automobile Co., at Eighteenth and Pine streets. D. Donnelly is the president of the new organization,

Recent Incorporations

Columbus, O.—Sea Island Tire Co., capital stock \$15,000; to manufacture and sell tires and tire protectors; incorporators J. C. Brooks, A. L. Welch, A. C. Miller and D. C. Westerhaven.

Peoria, Ill.—Reliable Tire Repair Co., capital stock \$2,400; to deal in and repair motor cars; incorporators John V. Leslie, George Haas and Bert A. Fritz.

Richmond, Va.—Buena Vista Garage and Automobile Co., Inc., capital stock \$5,000; general motor car business; incorporators W. B. Pritchard, De S. H. Goeckely, D. S. Bromley and N. B. Pritchard.

Columbus, O.—Pioneer Motor Car Co., capital stock \$18,000; to manufacture, deal in and sell motor cars; incorporators Tasker B. Bosworth, A. J. Watson, A. A. Crawford, T. McCune and H. L. Cosn.

Youngstown, O.—Cutting Motor Sales Co., capital stock \$5,000; to operate sales agency; incorporators J. B. Detchon, R. E. Baldwin, J. H. Davis, J. W. Craver and W. L. Dales.

New York.—Endurance Tire & Rubber Co., capital stock \$10,000; to manufacture tires, etc.; incorporators W. G. H. Randolph, Edward W. Tabor and James E. Bennett.

New York.—Astoria Garage Co., capital stock \$5,000; conduct garage; incorporators Ferdinand A. Simons, Joseph Hirsch and Mary James Simons.

Newark, N. J.—Commercial Motor Truck Construction Co., capital stock \$125,000; to manufacture motor vehicles; incorporators Wm. Dimond, John True and W. Eugene Turton.

Camden, N. J.—Auto Chemical Fire Engine Co., capital stock \$1,000,000; to manufacture and deal in motor car chemical fire apparatus; incorporators F. R. Hansell, I. C. Clow and John A. MacPeak.

Augusta, Me.—Winkler Construction Co., capital stock \$1,000,000; to manufacture and sell motor cars, airships, etc.; incorporator E. M. Leavitt.

Utica, N. Y.—Utica Supply Co., capital stock \$10,000; to manufacture and deal in motor car supplies, etc.; incorporators Howell D. Crim, Charles S. Burrows and Oscar J. Brown.

Dayton, O.—Heathman-Solliday Motor Co., capital stock \$20,000; incorporators Frank B. Heathman, Charles H. Solliday, Grace B. Heathman, Zora Y. Solliday and Joseph J. Chamberlain.

Indianapolis, Ind.—U. Auto Varnish Sales Co., capital stock \$5,000; to deal in varnish; directors J. W. Chapman, Minnie E. Chapman and L. J. E. Foley.

which plans to handle used cars on a large scale.

Beloit, Wis.—William Crawford, a body finisher and painter, has established a shop at 1010 Prairie avenue.

Columbus, O.—Engle & Vincent, 111 Parsons avenue, have taken the central Ohio agency for the Locomobile.

Savannah, Ga.—The Harris Tire Co. has taken on the Hudson and Hupmobile and will continue to handle the Stevens-Duryea and Brush.

Milwaukee, Wis.—The new branch of the Fisk Rubber Co. is now located at 456 Milwaukee street, in the George W. Browne building.

Manitowoc, Wis.—Hagen & Van Akin have been appointed local agents for the Rambler and intend to build a garage and salesroom in the spring.

Denver, Colo.—C. A. Gunder, for many years connected with the Overland and Maxwell factories, has recently assumed the management of the Clarkson Street Auto Co.

Chippewa Falls, Wis.—The Northwestern Wisconsin Auto Co.'s garage was damaged \$2,000 by fire. The garage is owned by T. H. Field, of Rice Lake, Wis., who intends to rebuild at once.

San Francisco, Cal.—The Howard Automobile Co., coast distributor of Buick and Oldsmobile cars, has established a branch in Oakland in charge of Robert F. Thompson, formerly coast manager of the Michelin Tire Co.

Baltimore, Md.—The Oakland Sales Co., 107 West Mount Royal avenue, of which T. R. Jones is manager, has been appointed the agency for the R. C. H. The Oakland Sales Co. will move to its new quarters at 6 and 8 East Chase street after November 1.

Oklahoma City, Okla.—The Francis-Kackney Automobile Co., state agent for the Mitchell car, has moved from the former quarters to the new building erected by John L. Francis of this company. The building cost \$25,000 and is located at 706-708 North Broadway.

San Francisco, Cal.—S. G. Chapman, northern California distributor of Hudson and Hupmobile cars, has established a branch house in Oakland, just across the bay from here. This branch will take care of all of Alameda county. It will be in charge of Paul McMullen, son of an Oakland banker.

Indianapolis, Ind.—Motor row in North Capitol avenue, is to be further extended by the erection of a two-story motor car sales building at Capitol avenue and Michigan street. To make room for the new building, which will be owned by the Globe Realty Co., the former home of Carl G. Fisher will be razed. The new building will be of reinforced concrete construction and will cost about \$45,000. It is expected that it will be completed about February 1.



The Motor Car Repair Shop

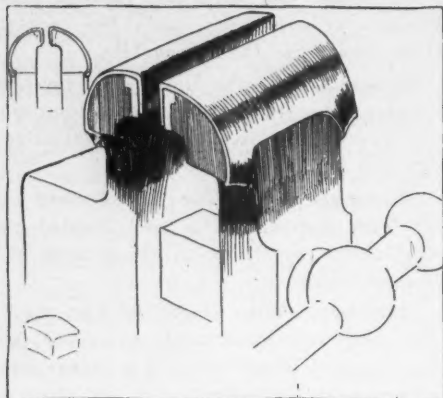


FIG. 1—VISE-JAW COVER

CONSIDERABLE damage often is done to highly polished or true bearing surfaces of various parts of a motor car by unskilled workmen who carelessly secure the parts in the jaws of a vise without some means of protection from the teeth of the jaws. Perhaps the most common example of this is found in securing stud bolts in a vise for the purpose of filing down or cutting off the heads, or drilling cotter pin holes in them. The workman often will secure the threaded end in the vise; and when he has completed his work upon it, and removed the bolt from the vise he will find that the threads have been damaged to such an extent that the bolt is useless and his work wasted. There have been cases where shafts and the like, with highly finished and true surfaces have been secured in a vise while the workman performed some operation on the end of it; and when it was removed, not only was the beautiful surface marred by teeth marks from the vise, but in order to smooth up the surface again the diameter of the shaft had to be reduced and a new bearing or bushing fitted to the part in which it normally rested. Often in dressing up the shaft damaged in this manner, it was filed out of round and replaced on the motor, with the result that it soon would show signs of premature wear and perhaps give rise to noise and other troubles.

To avoid burring up the surfaces of motor car parts, every motor car repairman should have a pair each of copper or brass and lead vise-jaw protectors; the brass or copper ones to be about $\frac{1}{8}$ -inch thick and used for holding steel parts, and the lead ones to be about $\frac{1}{4}$ or $\frac{3}{8}$ inch thick between the jaws and perhaps a little less on top of the jaws and to be used for holding more delicate brass parts and the like. These should be cut and applied as illustrated in Fig. 1. By fitting those to the vise so that the outer corners of each forms a tongue that may be sprung inward, they may be readily slipped onto

Hints to the Amateur

the jaws and securely held in place. In one of the largest gas motor factories in Germany, two sets of these vise-jaw covers are furnished to each bench workman, one set of copper, and the other set of lead.

Home-made Tube Tongs

In the ordinary repairshop, one occasionally is required to grip the tubing of the steering column so that it may be screwed into or out of the footboard plate. To do this the amateur or apprentice generally uses a pipe wrench upon the polished surface of the soft brass tubing, or removes it and the plate from the car and secures the tubing in the vise. In either case the tubing is almost sure to

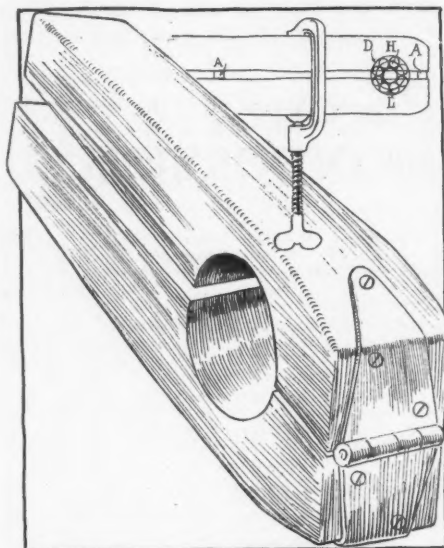


FIG. 2—A USEFUL TOOL

be marred or dented or both. A very simple tool such as is shown in Fig. 2 can easily be made to overcome this sort of trouble. It consists of two pieces of wood, hard wood preferred, a hinge at one end and a hole near the hinged end about the diameter of the tubing. To make this the two sticks of wood are clamped together with two spacers about $\frac{1}{8}$ or $\frac{1}{4}$ inch thick arranged between them as indicated in the corner of the sketch; a circle, the diameter of the tubing then should be marked off on one side near one end as indicated at D; and the sticks placed in the lathe or drill press to be drilled. If there is no drill on hand large enough to drill the hole, a 1-inch wood auger-bit will do to make the first hole in the center and a boring tool used in the lathe to increase the size of the hole to the required diameter. Another way would be to inscribe another circle within the circle D, and then use this line as a center for a series of holes H by means of which

the larger hole might be formed, the lathe then could be used to put on the finishing touches, or a pocket knife or reamer might be used where no lathe is available.

Holding Bolt Head

In the assembly and dis-assembly of motor cars in the motor car repairshop, one finds many bolts so inaccessibly located that considerable difficulty often is met with when an effort is made to keep the bolts from turning while removing the nuts. Nuts and bolts of this character often are found when one is required to remove the lower half of a motor crankcase, or the body of the car from the chassis, or where the carburetor is connected to the inlet pipe, as indicated in Fig. 3. In this illustration, the head of the bolt is so situated that one cannot get a grip upon it with a wrench; but by jamming the screwdriver end of the pliers between a flat side of the head of bolt and the side of the inlet pipe, the head is quite securely held against turning while the nut is loosened up with a wrench as indicated. A screwdriver or any suitable wedge-like instrument will serve the purpose, but one should insert the point of the tool in the direction in which the bolt head would tend to turn; thus the wedge will be jammed the tighter as the tendency of the bolt to turn increases; while if inserted from the opposite direction the tool would tend to be forced out from between the bolt head and the permanent surface against which it bears. On removing a series of bolts and nuts from any motor car mechanism, it is good practice to start the nut onto its respective bolt before throwing them into the receptacle in which they are to rest until the part is ready for re-assembly. By doing this and then rinsing them in kerosene or gasoline just before assembling them into place, the nut generally may be applied and all but tightened with the fingers.

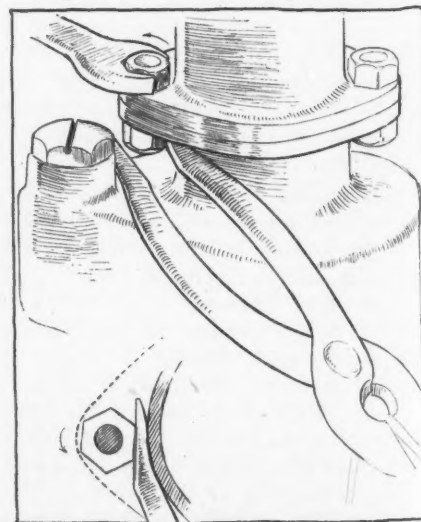


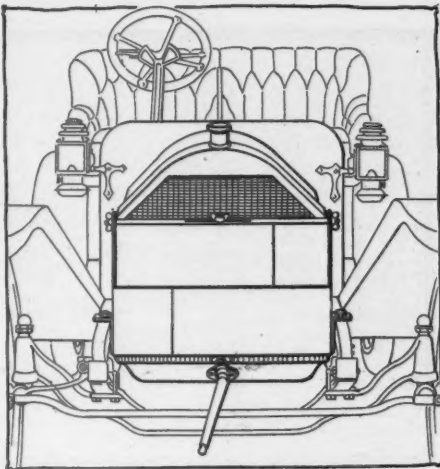
FIG. 3—MEANS OF HOLDING BOLT

Current Motor Car Patents

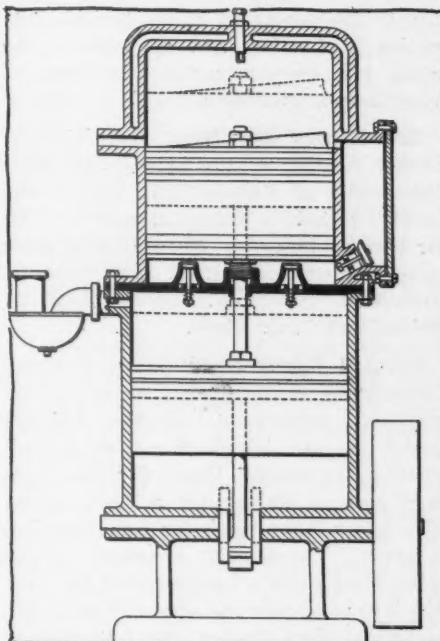
McINTYRE Air Pump—No. 1,001,667, dated August 29; to John J. McIntyre, Hartford, Conn.—This patent relates to an air pump, shown herewith, which should be adaptable for attachment to a motor car engine for the purpose of inflating tires, and maintaining compression in the supply tanks of self-starting systems. It is a combination of an air pump having a supporting bracket, a yoke movable along and rotatable on the bracket, a cylinder secured to the yoke, a piston movable in the cylinder, a stud extending transversely from the middle of the piston through a slot in the wall of the cylinder, heads for the cylinder, a bearing attached to one of the heads, shafts supported by this bearing, a crank on the shaft, and a rod connecting the crank and the stud projecting from the piston.

Dalman Non-Glare Head Lamp—No. 1,001,733, dated August 29; to John W. Dalman, Chicago—This patent covers a means for eliminating the glare of headlamps which comprises in combination a lamp casing having an opening, a source of light, a reflector in the casing, and a reflector in front of the source of light and shading the upper portion of the opening in the casing, the front reflector being adapted to reflect a portion of the rays from the source of light to the reflector in the casing back of the vertical plane of the source of light, and then out through the unobstructed portion of the opening.

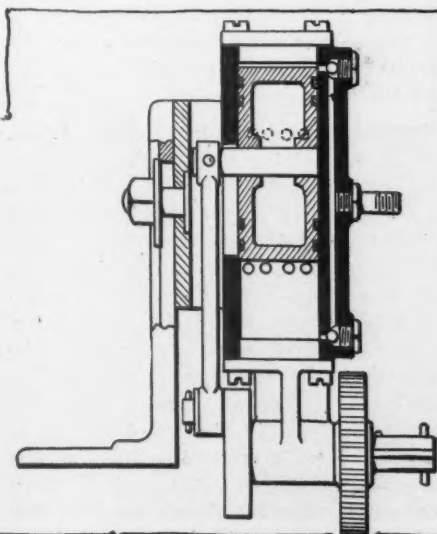
Steglat Internal Combustion Engine—No. 1,001,782, dated August 29; to Otto C. Steglat, Detroit, Mich.—The engine covered by this patent is shown herewith and is of the two-cycle type with double diameter cylinders. As shown there is an explosion cylinder, a compression cylinder in axial alignment with the explosion cylinder, a diaphragm between the cylinders and forming a head common to both of them, this diaphragm being provided with an opening therein; a check valve controlling the opening and arranged to open toward the explosion cylinder, pis-



MEIER RADIATOR WINDSHIELD



STEGLAT ENGINE

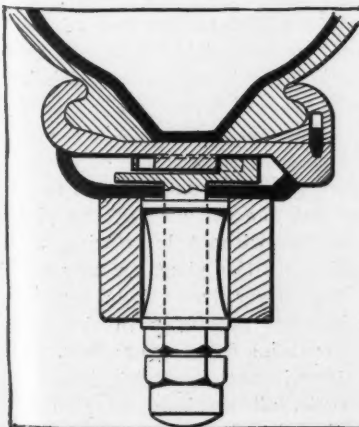


McINTYRE AIR PUMP

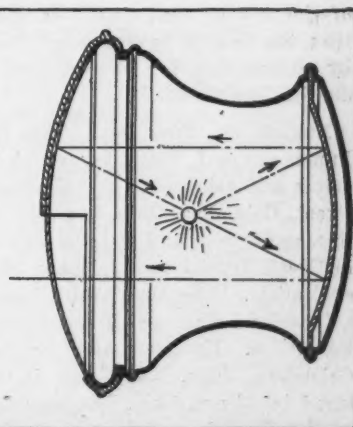
tons reciprocable in unison in the cylinder, an inlet pipe communicating with the compression cylinder adjacent to the diaphragm, a by-pass leading from the end of the explosion cylinder adjacent the diaphragm to a point between the ends of the explosion cylinder, and a check valve in the by-pass opening away from the end.

Meier Radiator Windshield—No. 1,002,071, dated August 29; to Ernest Meier, La Crosse, Wis.—This patent pertains to a device for preventing the freezing up of radiators in cold weather. It comprises a supporting member made up of two parts movable longitudinally with relation to each other, a longitudinal extending slot in each part, means engaging the parts and contained within the slots for holding the parts in fixed positions, a shield carried by each part, uprights carried by the supporting member, these uprights each being provided with a slot, a horizontally extending member made up of two parts movable relatively to each other, each part having a threaded end portion engaging in one of the slots in the uprights and each provided with a shield, means engaging each of the last named parts whereby they may be held in fixed relation, all of these shields being movable relatively to one another whereby the size of the shield as a whole may be varied. The supporting member being provided with end portions adapted to engage the frame of the motor car whereby the shield may be supported adjacent the radiator thereof.

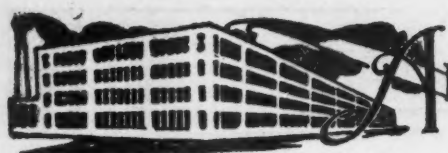
Baker Demountable Rim—No. 1,001,802, dated August 29; to John Baker, Pasadena, Cal.—This patent pertains to a demountable rim comprising a fixed rim, a demountable rim thereon, a plurality of eccentric locking lugs, rotatably mounted in the fixed rim and a series of fixed lugs on the demountable rim located concentric with the axes of the rotatable lugs, whereby the rotatable lugs may be removed into positions on either side of the fixed lugs on the demountable rim to either lock or unlock the demountable rim.



BAKER DEMOUNTABLE RIM



DALMAN NON-GLARE HEADLAMP



Among the Makers and Dealers

CINCINNATI Show in February—It has been decided by the Cincinnati Automobile Dealers' Association to hold its second show play in Music hall, during the month of February.

Toledo Dealers Elect Officers—At a meeting of the Toledo Automobile Dealers' Association the following officers were elected: President, C. Z. Kroh; vice-president, Stanley Roberts; secretary, H. W. Blevins; treasurer, J. W. Banting.

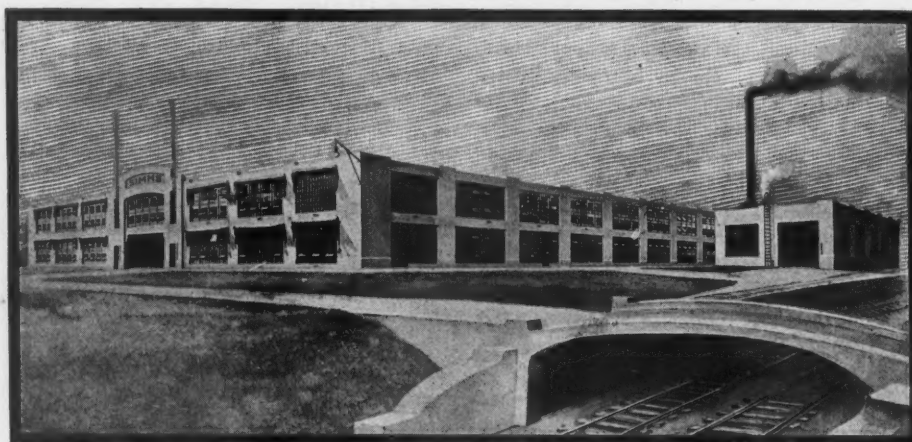
Ellis Joins Johnson—H. W. Ellis of Chicago hereafter will head the sales department of the Johnson Service Co.'s motor car department at Milwaukee, where the plant is located. The Johnson company now occupies the entire lower floor of the new Stroh building, opposite the postoffice in Milwaukee, as a showroom for its trucks and pleasure cars.

Opening Sought at Cortland—The little city of Cortland, N. Y., may have a motor car factory employing at least 300 men, according to the announcement of the Universal Smoke Separating Co. there. Its officers state that a motor car concern capitalized at \$2,000,000, whose name they refuse to divulge, has offered a large rental, that will likely be accepted, for the use of half the Universal plant.

Changes Fiscal Year—The fiscal year of the General Motors Co. has been changed so as to end July 31 in place of September 30, as heretofore, in order to permit the manufacturing department to take inventory at the most convenient time of the year. This will mean that the forthcoming statement of earnings will be for a 10 months' period, running from October 1, 1910, to July 31, 1911.

Chicago Fall Opening Date Changed—Instead of being held the week of September 30-October 7, the fall opening of the Chicago Automobile Trade Association will take place a week later—October 7-14—the postponement being caused by inability to complete the electric lighting of the row by that time. At the present time the dealers have a large fund raised by assessment, for the purpose of conducting the show.

English in Tire Deal—The Cleveland Puncture-Proof Tire Co., which had its offices and salesrooms at 1355 North High street, Columbus, Ohio, has sold the right to manufacture and sell the patented tire in Great Britain to a company of English capitalists. The tire is the invention of a Cleveland man, which was purchased by Robert S. Knepper and associates, of Columbus, Ohio. The tire is manufactured in Akron, Ohio. The representatives of the English company say that contracts have been made to supply the new



NEW PLANT ERECTED AT BLOOMFIELD, N. J., FOR SIMMS MAGNETO CO.

tire to practically all of the taxicab companies in London, and as soon as the plant can be constructed the work of manufacture will begin.

One Kansas City Show Date—At the annual meeting of the Motor Car Trade Association of Kansas City, Mo., it was decided to hold a motor car show the latter part of January. The following show committee was elected: T. S. Day, Robert Greenlease, Nelson T. Haynes, John A. Nelson and C. B. Riggs.

Goddard Enters Trade—H. A. Goddard, formerly in charge of the motor car advertising department of the Chicago American, has joined the sales department of the Gramm Motor Car Co. Goddard goes to Europe for a year, taking with him a 3-ton truck for demonstration purposes. The Gramm company intends going after foreign business, and not only will invade Europe but also will enter the South American market. Steps have been taken by the Gramm company to increase the capital stock of the corporation from \$300,000 to \$1,250,000, for the purpose of increasing the output of the plant: Of the increased stock half will be common and the other preferred.

Pittsburghers Invade Toledo—A. C. Berry, representing Pittsburgh capitalists, has closed a contract for the purchase of 27 acres of land on the Michigan Central railroad tracks in Toledo. It is said that the Pittsburgh people will organize a Toledo corporation for the purpose of building a large factory and manufacturing a complete line of motor car parts. The property has a frontage of 800 feet on the Michigan Central railroad. The purchase price was in the neighborhood of \$35,000. It is planned to capitalize the company at \$500,000, the project to be financed by the Pittsburgh people. The railroad frontage will be covered by a two-story brick and concrete building,

185 by 600 feet in dimensions. The plans also contemplate the erection of a main factory building of brick and concrete, fireproof construction, 220 by 600 feet and four stories high.

Government Awards Big Contract—Under bids opened some weeks ago the bureau of yards and docks, navy department, has awarded the contract for furnishing twelve electric trucks to the navy yards at Portsmouth, N. H., Boston, New York, Norfolk, Charleston, S. C., Mare Island, Cal., Puget Sound, Wash., and Guam. The contract price was \$49,000. Eight of the trucks will be 5,000-pound machines and four of them 10,000-pound trucks. The 5,000-pound trucks will be of the express type, while the others will be of the stake type. Delivery is to be made within six months. These trucks will be designed to handle heavy freight and in addition will do general hauling to and from the navy yards.

New Simms Plant—In the large plant which the Simms Magneto Co. has erected at Bloomfield, N. J.; where from now on the various Simms ignition devices will be manufactured, a unit type of construction has been employed, consisting of reinforced concrete beams and girders. The walls contain 18,942 square feet of glass with a wall surface of 16,500 square feet. The shape of the Simms plant, which has at present two stories, forms a rectangle, with a courtyard 50 by 150 feet in the center, and has been so constructed that it may be easily extended on the ends or upwards, so that the capacity of the plant can be doubled without interfering with the operation of the plant as now completed. The power house is a separate building in close proximity to the main plant, and contains 6,000 square feet. The whole factory is equipped with American machine tools, all specially adapted for work of the closest accuracy. In fact, many machine tools have been specially

built for the Simms Magneto Co. Among the many departments may be specially mentioned the testing room, with its various testing apparatus and many types of explosion motors, and the experimental department, where all new ignition devices are first tried before being submitted to the test on engines in the testing room and on the road.

Likely to Get Crowe Plant—The Commercial Club of Grand Rapids, Wis., has obtained sufficient subscriptions to meet the guarantee demanded by W. A. Crowe, of Detroit, who proposes to manufacture a new 30-horsepower car to be known as the Crowe. It is now considered certain that the new Crowe plant will be established in Grand Rapids. It is proposed to incorporate for \$200,000, of which amount \$40,000 is to be awarded to Mr. Crowe and W. M. McIntyre, designer of the car, as their share for patent rights, designs, tools, etc. The company proposes to manufacture the motor, clutch, transmission, radiator and fenders, purchasing the remaining parts from specializing manufacturers.

Trade Outlook in Atlanta—Atlanta, Ga., continues to be the center of the southeastern motor trade, and it also continues to be the center of unceasing changes in dealers, branches and the like. At present eleven manufacturers are represented in Atlanta by branch houses or by concerns that virtually amount to that. Here is the list: Overland Southern Motor Co., United Motor Atlanta Co. Maxwell, Columbia, Sampson; States Atlanta Motor Co., Stoddard-Dayton and Courier; Mitchell-Lewis Motor Co., Mitchell; J. I. Case Threshing Machine Co., Case; Ford's southeastern branch, Corker Motor Car Co., in effect a branch of the Haynes, also carries the Matheson; Stearns' southeastern branch; southern branch Buick Motor Co., southeastern branch Studebaker Corporation. In addition to the eleven branches the Gate City of the south has at least eleven active

agencies, most of which are housed in their own places of business, with garage accommodations. The branches, dealers and accessory folk are gradually collecting on the north edge of the Peachtree business district.

Klaxon Within the Law—Representatives of the Klaxon warning signal have made demonstrations before Chief of Police McWeeny, of Chicago, which have convinced that official that this electric device is not included in the restrictions placed by the city of Chicago, which has passed an ordinance prohibiting the use of the siren type of horn. The chief has ruled that in his judgment the "reasonable use of the Klaxon warning signal as a warning of danger is entirely proper and not in violation of the terms of the ordinance."

Change in Jonz Affairs—Berton B. Bales has resigned from the office of president of the American Automobile Mfg. Co., whose offices and plant are situated in New Albany, Ind. It is understood that George H. Wilson, of Louisville, will be selected as Mr. Bales' successor. The latter will retain his interest in the company, but will devote his time to his private business affairs. The company makes the Jonz car, and at present about sixty workmen are employed in the plant. Two 1912 models have been turned out recently. About \$300,000 worth of stock has been sold.

Overland Gets Crop Reports—The Willys-Overland Co., of Toledo, has installed a daily report system by which the office sales force is kept informed of crop, weather and commercial conditions from all parts of the United States, Canada and Mexico. George W. Bennett is in charge of the system and will use it as a barometer in his distribution of cars. Enthusiastic dealers will not be permitted to overstock in sections where crops have been below standard, or where there is commercial depression. Under this system it is expected that it will be unne-

cessary for the company to over-produce, because the manufacturing end is kept informed of conditions through the sales department.

Working on Truck Plant—Work has been begun on Bay City's latest industry, the National Auto Truck Co.'s plant. The contract for the excavation has been let and the work will be completed as rapidly as possible.

Ricketts in Michigan City Deal—Announcement has been made that J. W. Ricketts, formerly of South Bend, Ind., will soon start a motor car factory in Michigan City, Ind. The cars are to be known by the name of Ricketts. A company will be incorporated with a capital of \$20,000, made up largely of Michigan City money. The Commercial Club of that city has taken up the matter of securing quarters for the factory. The Michigan City company is to be incorporated under the name of the States Motor Car Co.

Locating Parts Factory—Another big plant in the middle west will soon be added to the chain of manufacturing properties constituting the United States Motor Co. This will be the establishment of a special factory to manufacture parts of all of the models of past seasons including the cars of Maxwell-Briscoe Motor Co., Columbia Motor Car Co., Dayton Motor Car Co., Brush Runabout Co., and the Alden Sampson Mfg. Co. D. C. Mitchell, construction engineer of the company, is now in the west looking for a site for the factory. About 100,000 square feet and ten acres of land are required.

Swinehart Election—The annual meeting of the stockholders of the Swinehart Tire and Rubber Co., of Akron, Ohio, was held at the offices of the company recently. Reports showed an increase of business over the previous year of 200 per cent. The following were elected as directors for the ensuing year: August Blessman, R. A. May, L. Mather, William McWeldon, W. W. Wuchter. After the stockholders' meeting the board was organized and the following officers elected: W. W. Wuchter, president and general manager; Joseph Dangel, vice-president; C. O. Baughman, secretary; R. A. May, treasurer.

Duplex Company Election—The Duplex Power Car Co.'s affairs took a new turn when the adjourned annual meeting of the company was held at Charlotte, Mich., and an entirely new set of officers and directors was chosen to take charge of affairs. The local stockholders elected a new board of directors, comprising Frank P. Town, James H. Brown, Robert Donovan, W. G. Wisner, Frank King, W. B. Fulton and M. J. Lamson, all local men. Later the board met and elected the following officers: President, Frank P. Town; vice-president, Frank King; secretary, W. G. Wisner; treasurer, Carroll S. Brown. The new officers have taken possession of the plant.



STRUCTURE USED FOR TESTING LAMBERTS. GRADIENT IS 50 PERCENT. AND ENTIRE LENGTH OF THE ARTIFICIAL HILL 100 FEET



Development Briefs

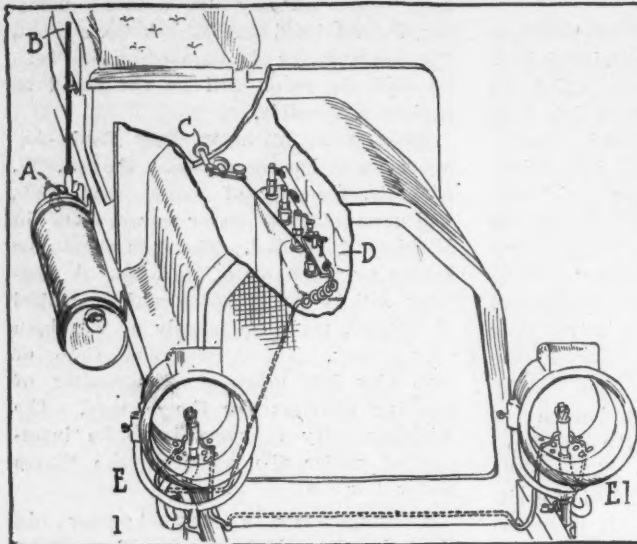


FIG. 1—ARRANGEMENT FOR LIGHTING ACETYLENE LAMPS

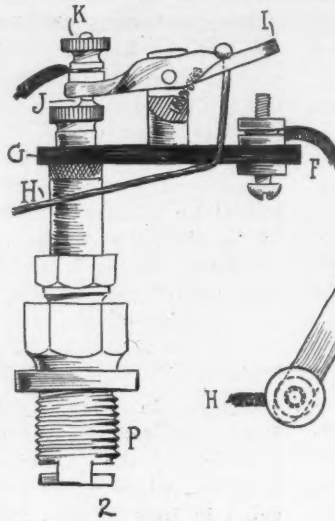


FIG. 2—ATTACHMENT TO SPARK PLUG FOR LIGHTING LAMPS

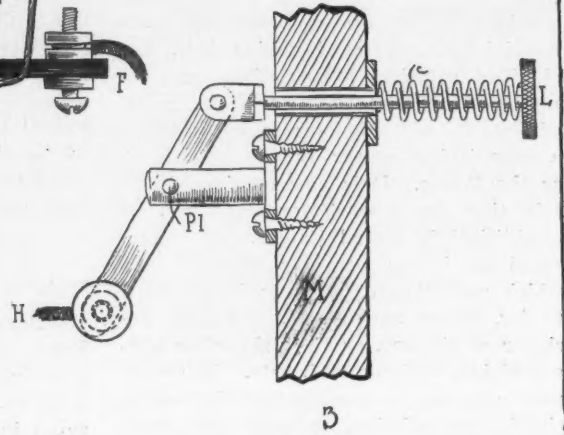


FIG. 3—PUSH BUTTON ON THE DASH-BOARD

Self-lighting Acetylene Burner

ONE of the latest systems for lighting acetylene headlights from the driver's seat is the Matchless self-lighting burner marketed by the Matchless Burner Co., Chicago. The chief feature of this system is the utilization of the high-tension spark normally used for the ignition of the charge in the cylinders, for igniting the gas at the burners of the lamps. The current is diverted momentarily for lighting the burners.

The arrangement by which this is accomplished is illustrated in Figs. 1, 2 and 3. The general wiring of the system is shown in Fig. 1. Fig. 2 shows the spark plug, with the special attachment. The high-tension wire is removed from its usual position and in place of it is inserted the fiber disk G. This carries a metal arm I pivoted at the middle and a contact screw and terminal at the outer end for the attachment of the wire F to the burner. The other end of the arm carries the terminal K to which is attached the wire from the coil. The weight of this, assisted by the spring, holds it normally in contact with the top of the spark plug at J. When, however, the outer end I of the arm is pulled downwards by means of the cord H, contact is broken at J and made at the other end between I and the screw.

This sends the current to the burners through the dotted lines shown in Fig. 1. The burners are equipped with metal sparking points so disposed that the gap is in the path of the gas as it issues from the burner. The burner E1 is in series with burner E and the wire is grounded at E1. At G, Fig. 1, is shown the push button on the dash, by which the arm I, Fig.

2, is operated. It is illustrated in detail in Fig. 3 and consists simply of a rod passing through the dash M and terminating in a button L, held normally away from the dash by the spring S. To the forward end is connected a lever pivoted at P1, and to which is attached the end of the cord H. Pushing the button tightens the cord and pulls the arm I down into contact with F.

In conjunction with this is a controller for attachment to the generator or gas tank by which the gas may be turned on from the seat. This consists of a valve A which is operated by the vertical rod B.

Crum's Gasoline Filter

The Crum-Wiley Mfg. Co., Decatur, Ill., is manufacturing the Crum gasoline filter used to separate water and foreign particles from gasoline. It is inserted in the

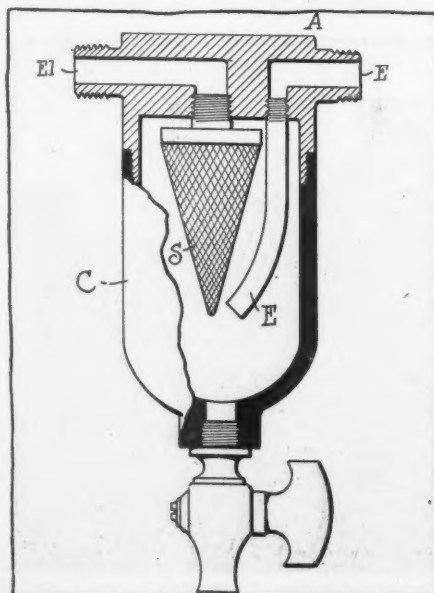


FIG. 4—CRUM'S GASOLINE FILTER

gasoline line between the tank and the carburetor. Fig. 4 illustrates it. The casing C is a brass or aluminum casting into which the gasoline enters by way of the pipe E and escapes by the passage E1. The straining-feature is a conical screen S of such fine mesh that water will not pass through it. This cone is threaded into the short pipe A, which is inserted in the gasoline line. Where this casting unites with the brass or aluminum cup C a ground joint is made use of, eliminating any possibility of leakage. In operation the gasoline entering at E fills the cup C and the water and heavy particles settle in the bottom of the cup and the gasoline in the top. The gasoline has to pass through the screen S before it can escape through the exit E1. By slightly curving the intake pipe E it makes it possible to unthread it out of the casting A and there is a slight notch in the metal frame to which the screen S is attached, which notch receives the pipe E so that pipe becomes a method of locking the screen S and preventing it unthreading on the part A. A drain cock in the base of cup C permits of the quick removal of water. As the cup C threads on the part A it can be quickly taken off to clean it. When off the pipe E can be unthreaded and after that the screen S will readily unthread, giving a filter in which all parts can be removed for cleaning or other purposes.

Hartford Safety Crank

Since the advent of the motor car, and during the years of its subsequent development, the problem of devising a means of starting the motor in a simple and easy manner, and to accomplish this result with the least danger from a back kick, has received the attention of the best engineers and designers of motor car parts.

One of the latest of the solutions of the problem appears as the Hartford safety crank, designed and marketed by the Hartford Suspension Co., of Jersey City, N. J. In this safety crank, illustrated in Fig. 5, a reduction of motion is obtained by means of a train of gears so that less force need be exerted to turn the motor over than is required with the ordinary crank. A circular ratchet is permanently attached to the gear housing, and with this a spring plunger pawl makes a connection. A friction joint based on the principle of the Truffault-Hartford shock absorber connects the crank with the gearing. The friction may be regulated by an indexed plate similar to that used on the shock absorber made by the same firm.

The friction is just sufficient to enable the low-gear crank to turn the engine. In case of a back kick the ratchet wheel and pawl prevent the crank from turning backward, the friction plates slip and allow the motor to reverse.

Sprague Windshield Ventilator

The advent of the fore-door body has brought with it the problem of ventilating for the front seat passengers, and in solving this the Sprague Umbrella Co., Norwalk, O., has made use of the windshield to accomplish the end. As Fig. 7 illustrates, the lower half of the windshield is carried on a rearwardly extending bracket from the top of the dash. The bottom of the windshield is adjustable in this bracket, so that when the base of the shield is moved backwards there is opened a space through which the air currents pass. With the base of the shield vertical, as shown in dotted lines, this space is closed. A finger wheel anchors the shield at any desired point. The supporting bracket used at each end is shown enlarged in Fig. 8.

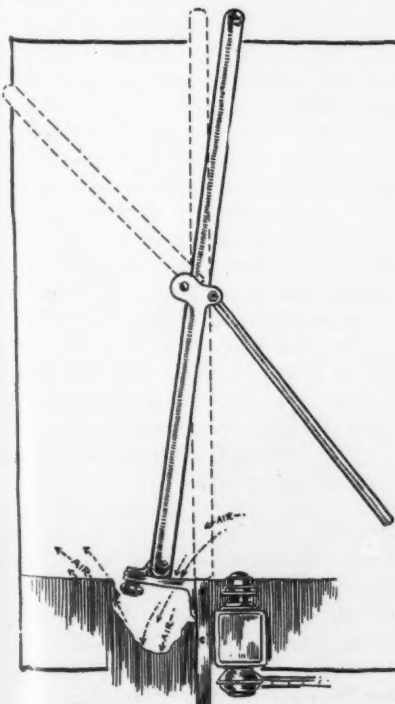


FIG. 7—SPRAGUE WINDSHIELD VENTILATOR

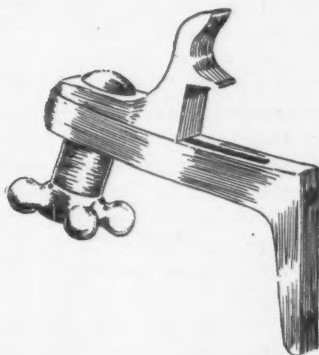


FIG. 8—ADJUSTABLE BRACKET FOR WINDSHIELD VENTILATOR

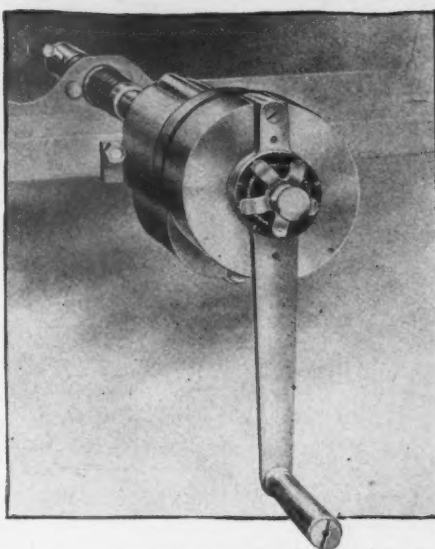


FIG. 5—HARTFORD STARTING CRANK

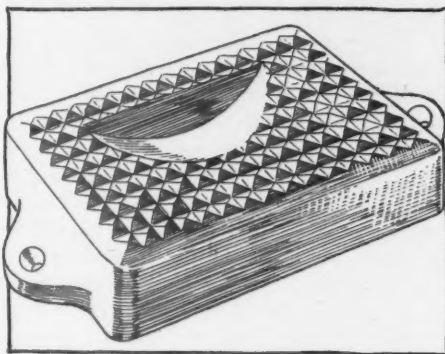


FIG. 6—DRIVER'S HEEL REST

This concern has on the market its No. 33 clear-vision windshield, Fig. 9. In this shield the upper half can be set at different angles and locked therein; and the lower half, by using telescoping supporting-rods, can be laid horizontally over the top of the hood or tilted to any desired angle. In addition to the upper half swinging on its

hinges it is supported on two long hinge pieces, which in turn can be placed in different position, thereby giving a very wide range of combinations of positions.

Driver's Heel Rest

In order to reduce the fatigue of the driver's foot which must be kept on the pedal when operating the car, a heel rest has been produced to act as a support for the heel and to serve as a fulcrum when the pedal is pressed with the sole. The foot rest is made by L. Lucas & Son, of Bridgeport, Conn. It is cast of aluminum and is about 4 inches long, 3 inches wide and 1½ inches high. In place of a base plate there are two flanges projecting from the bottom by which it may be attached with screws to the footboards. The face is provided with an indentation to fit the heel and the rest of the surface is roughened to prevent slipping. It is illustrated in Fig. 6.

Tire Repair Pliers.

There are and have been for some time on the market a number of rubber compounds to be used in repairing cuts in tires.

To get the best satisfaction out of the use of these various compounds and the greatest mileage out of tires, it is necessary to go over tires regularly. For this purpose G. Walker Gilmer, Jr., of Philadelphia, Pa., has put on the market the Gilmer tire repair pliers. The points of these pliers are turned down at right angles to the plane of the handle. There are three handles or levers. By pressure on the middle lever and one outside lever the jaws are closed and pliers can be used for gripping. In this position the points of the instrument can be inserted in the cut, and then by pressure on the middle lever and the other outside lever, the points are forced open.

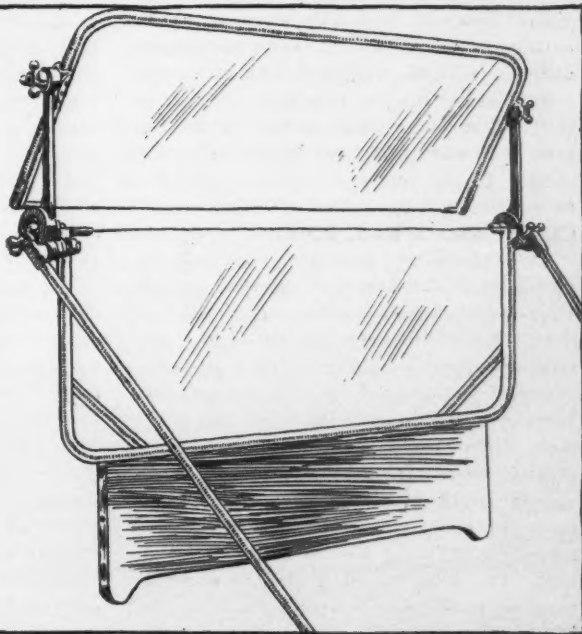


FIG. 9—SPRAGUE CLEAR-VISION WINDSHIELD



Legal Lights and Side Lights

LOUISVILLE CAR OWNERS SCARED

CHARGING 800 car owners and operators with violating section 4 of the state law, requiring that the number of the state license be displayed on two lights of each machine in addition to the regular license tags, warrants are being served in Louisville, Ky., by constables of Magistrate Andrew P. Vogt's court. As motorists have been ignoring this section of the law for some time, because they contend that it conflicted with section 3 and was impractical, the action comes like a bolt from a clear sky. Warning has been sounded to members of the Louisville club that the crusade is being waged and many are heeding the warning and hastening to comply with the law. It is believed that most of them will be too late, however, the evidence against them having already been obtained. So unexpected was the demand for lamp number plates that the small supply kept in stock by local accessory dealers soon was exhausted. As a result, painters are kept busy putting the numbers on. It is said that before the prosecution is ended that but few of the owners of this city will have escaped.

If convictions are obtained in all of the 800 cases, it will mean a snug little sum for the magistrate, the constables and prosecuting attorney. The law provides that when convictions are obtained in commonwealth cases in magistrates' courts, the prosecuting attorney shall receive a fee of \$5 and the court costs shall be \$4. Usually the arresting officers receive \$1 and the squire, acting as trial judge, receives \$3. The duty of prosecuting the cases will fall upon the county attorney and his assistant. In the event a conviction can be obtained in each of the 800 cases the fees would be as follows: Prosecuting attorney, \$4,000; trial judge, \$2,400; officers serving warrants, \$800.

CLUB CARD A BAIL BOND

As a result of a conference between the members of the board of directors of the Portland Automobile Club with Chief of Police Slover, membership cards of Portland motorists belonging to that organization will be accepted as bail if any member is arrested for violation of the speed laws. The present police regime was indisposed to recognize the membership cards, and invariably the offender was forced to go to the police station and go through the procedure of being booked and putting up bail. The club has long had a standing bond at police headquarters, providing for the appearance of any member arrested for reckless driving.

In order to have a thorough understanding, representatives of the club talked to

Chief Slover. This resulted in the issuance of new cards for 1911 bearing on the back, over the signature of E. A. Slover: "The officer making the arrest of the holder of this card for violation of the motor speed and traffic regulations will retain this card and immediately release the party. The arrested person will not be brought to the station, but the officer will book the party from information obtained from this card."

"The holder of this card must report to the municipal court at the first session following arrest. If this is not done, this card will be revoked," adds the club.

ODD ORDINANCE IN MILWAUKEE

Determined to gain the profit of fines for violation of the laws relating to motor cars for the city treasury, the common council has passed an ordinance calculated to reap this harvest, which has been going into the state treasury because the law is a state act. The new ordinance, which has just been approved by the socialist mayor, after passage by the socialist council, is a puzzle to legal minds and may possibly be declared unconstitutional. It covers all violations occurring within the city limits of Milwaukee, and says that all who are convicted of violations shall forfeit to the city certain sums which are the same as the fines demanded by the state law. It is not known if a person upon conviction would be required under this ordinance to pay two fines, one to the state and another to the city, and motorists are at sea.

WOULD CHANGE MARYLAND LAW

A resolution was introduced into the Baltimore city council by Councilman Garland, which directed that the joint special committee on legislation of the two branches of the council during the next session of the Maryland legislature be empowered to draft amendments to the motor vehicle law regarding the issuing of licenses. These proposed amendments call for the appointment of a reliable board of examiners, to whom all applicants for licenses to operate motor cars shall submit their claims and qualifications. Councilman Garland's aim is to have licenses withheld from all persons except those who, in addition to possessing the proper skill, are sufficiently cautious in their habits and not a menace to the general public. Furthermore, Mr. Garland desires to have a provision inserted making it punishable for anyone to operate a motor car unless he is an actual license in his own name; also that the city of Baltimore shall receive a volume of revenue from motor car licenses in exact proportion to the number of motor car licenses granted to residents of the city.

OREGON WANTS LAW INTERPRETED

Demanding that an interpretation of the Oregon motor law, the Portland Automobile Club has decided to carry the matter to the state supreme court and get a definite ruling as to what the motorists are to do and not to do. This action was deemed necessary by the directors in order to get a decision that would be authoritative, and at a recent meeting they instructed the club's attorney to act at once.

It will be arranged according to the program decided on to have the same man arrested on the three following charges: Driving a private car not his own without a chauffeur's license; running a motor car after dark without lights; driving without a city license.

Since the new state law went into effect the motoring world of Oregon has been at a loss as to what course to pursue. Although drafted by motorists, the new law is not as clear as it might be and in consequence the motorist does not fully understand many points.

The state law, according to general opinion, is supposed to do away with all municipal regulation. It provides for a reasonable speed under existing conditions, whereas the city ordinances set the limit at 12 miles an hour. The traffic regulations of Portland pertaining to the operation of motor vehicles, recently promulgated by the motor car registry board, are manifold and in some cases in conflict with the state law.

What the club is trying to determine, above other things, is whether a driver of a private car, if it be his own or not, is compelled to have a city chauffeur's license. This is one of the main points at issue and will be warmly contested. Another thing that the motorists do not like is the order compelling them to get city licenses. The state law provides that each car must carry a license on the rear of the car and a duplicate on a prominent part of the front. The city also demands that it carry two city licenses, placed on the car in the same manner as designated in the state bill. This makes a total of four signs, all to occupy conspicuous positions, which the club says is too many. The directors see no need of the city licenses and are going to test the legality of the ordinance before they comply with the regulation.

The reason for having the man arrested for driving without lights is to determine if there is not some way by which the driver of a vehicle, other than a motor car, can also be compelled to have lights. The state law, which was originally intended to apply to vehicles of any description, has been interpreted by legal authorities as applicable only to those propelled by motor power.